THE AUTOMOBILE

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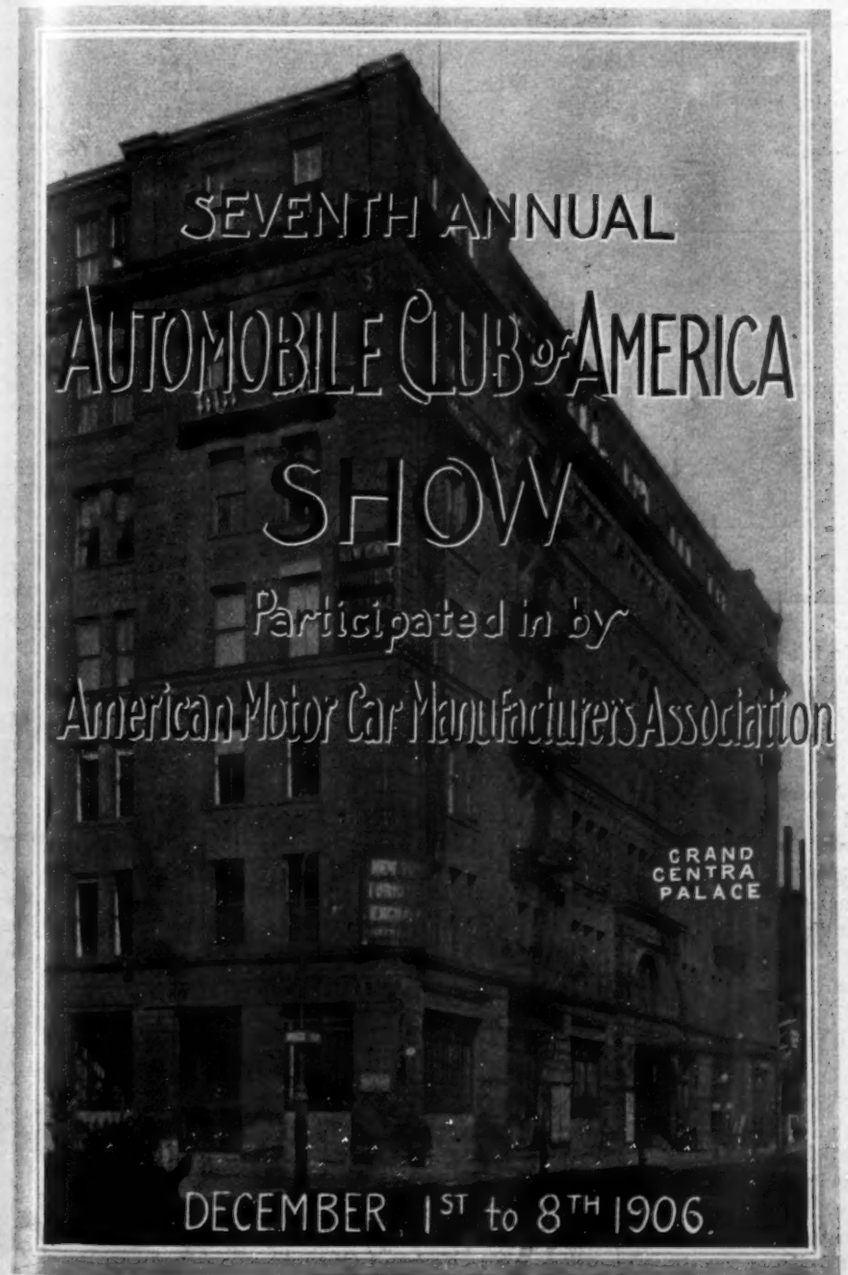


ON LEXINGTON AVENUE BETWEEN FORTY-THIRD AND FORTY-FOURTH STREETS

THE first of the winter automobile shows will open Saturday night at 8 o'clock in the Grand Central Palace, the event being the seventh exhibition wherein the Automobile Club of America has been a prominent part of the promoting machinery. Associated with the A. C. A. is the American Motor Car Manufacturers' Association, the members of which supply the greater part of the complete vehicles contained in the show. Many of the concerns exhibiting are pioneers in automobile construction in this country, but there are also new names, some of which are very recent in the list of manufacturers. The foreign representation is quite complete and embraces twelve French makes, four English, three Italian, one German and one Swiss; in fact, the best European models will be on view. Of the 230 exhibitors, 94 are manufacturers of complete vehicles, the remainder being makers of many accessories now necessary in this great industry. While the earlier date will find many of the exhibitors in a hurried state of preparation, the promoters consider December more satisfactory in a general way, both to the public and to the industry, pointing as a precedent to the early European shows.

In convenience the Grand Central Palace, at the corner of Lexington avenue and Forty-third street, will be particularly available to out-of-town visitors who arrive at the Grand Central Station, and the presence of a half dozen enormous hotels in the near vicinity adds to the value of the location. The Palace might be improved upon as an exhibiting place for automobiles, but wonders have been accomplished in remodeling it for the purposes of the present show. The decorating has transformed the big building until it is almost presentable. The color idea has an outdoor aspect, gray, green and brown forming the basis of the scheme by which the results are gained. Brown is the floor covering, imitating the dusty highway; a soft gray for columns and panels supplies a fleecy cloud effect, and the green lettering of the signs on a white background completes the pleasing picture.

Demonstrating cars promise to be more numerous than ever, and it is good guessing that Forty-third and Forty-fourth streets will be scenes of unusual activity during the entire

IN 1896 THIS PIONEER DURYEA WAS A SOURCE OF AMAZEMENT.

week. Each exhibitor having a demonstration car will be provided with a numbered space, avoiding the general confusion that has been apparent on other occasions. The Bureau of Information will be conducted as customary, and out-of-town manufacturers, agents and dealers will receive special attention, mail, telephone messages, and appointments being included in the work of the bureau.

At the A. C. A. show of a year ago aeronautics was given a substantial place, and this year the Aero Club of America will have an even more complete department that will tell of the progress made in the navigation of the air. Air traveling is unquestionably the next phase of motoring, and many leading automobilists are taking widespread interest in this problem, which seems to be on the verge of solution. The vitagraph presentation of the Vanderbilt Cup race will be a feature, and the views will also include the notable balloon contests of the year.

Though the general public will not be admitted until evening, there will be a private view for members and their guests in the afternoon between 4 and 6 o'clock, this being one of the annual functions of the club, which contains a generous number of society folk.

MEETINGS AND FUNCTIONS

Saturday, Dec. 1, 4 P. M.—Private view of Show to A. C. A. members and the press; Grand Central Palace.

Sunday, Dec. 2, 8 P. M.—Smoker of New York Motor Club; Reisenweber's, Seventh avenue and Fifty-eighth street.

Tuesday, Dec. 4, 3:30 P. M.—Meeting Board of Directors of the American Automobile Association; Convention Hall, Grand Central Palace.

Wednesday, Dec. 5, 3 P. M.—Meeting American Automobile Association; Convention Hall, Grand Central Palace.

Wednesday, Dec. 5, 7 P. M.—Annual dinner Long Island Automobile Club, 360 Cumberland street, Brooklyn.

Wednesday, Dec. 5, 11 A. M.—Meeting Executive Committee, National Association of Automobile Manufacturers; No. 7 East Forty-second street.

Thursday, Dec. 6, 10:30 A. M.—Meeting Board of Directors of New York State Association of the American Automobile Association; Convention Hall, Grand Central Palace.

Thursday, Dec. 6, 1 P. M.—Luncheon to A. C. A. Show exhibitors by American Motor Car Manufacturers' Association; Hotel Manhattan.

Friday, Dec. 7, 11 A. M.—Meeting Mechanical Branch of the Association of Licensed Automobile Manufacturers; No. 7 East Forty-second street.

Saturday, Dec. 8, 8 P. M.—Annual banquet Automobile Club of America, Sherry's, Fifth avenue and Forty-fourth street.

THE CARS OF THE PALACE SHOW.

AMERICAN CARS.

PREVIOUSLY EXHIBITED.

Acme	Duryea	National
Aerocar	Ford	Pierce-Racine
American Mercedes	Frayer-Miller	Premier
Austin	Glide	Pungs-Finch
Berkshire	Grout	Rainier
Berliet	Jackson	Rambler
Cartercar	Lambert	Rapid
Cleveland	Logan	Reo
Compound	Marion	Shawmut
Crawford	Marmon	Stoddard-Dayton
Detroit Auto Vehicle	Maxwell	Wayne
Dolson	Mitchell	Welch
Dorris		Wood

EXHIBITED FOR FIRST TIME.

American	Dragon	Moore
American Mors	Evansville	Mora
B-L-M	Frontenac	Penn
Conover	Harrison	Pullman
De Luxe	Maumee-Craig	Smith
Detroit	Moline	Triumph
	Moon	

STEAM CARS.

White	Lane

COMMERCIAL VEHICLES.

American Truck	Cartercar	Logan
Atlas Truck	Commercial Truck	

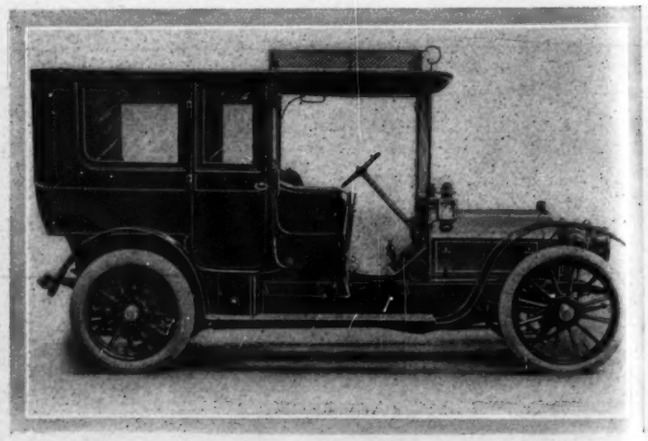
FOREIGN CARS.

PREVIOUSLY EXHIBITED.

Bollee	Gordon-Brillie	Panhard
Brasier	Martini	Renault
Delahaye	Mercedes	Westinghouse
Delauney-Belleville	Mors	Zust
English Daimler	Napier	

EXHIBITED FOR FIRST TIME.

Argus	Itala	Rossell
Bianchi	Pilain	Rolls-Royce



AND NOW, 1906, WE HAVE MANY DE LUXE LIMOUSINES.

MECHANICAL PROGRESS TOLD IN THE SHOW

By VICTOR LOUGHEED.

AS was the case with the six shows that preceded it, the seventh annual show of the Automobile Club of America will disclose a mechanical progress in the automobile industry far exceeding the similar progress in any previous twelve-month. Not only will the older established makes show vast improvement, but to their ranks will be added over a dozen newcomers, in whose product will be manifested an equally well-considered study of the vital points of modern automobile engineering.

Improvement in details seems to be the chief work of the present-day designer, whose successful solutions of the more serious problems of seasons past have left little that is fundamental to be coped with to-day. From the attempt to improve details has come much of the standardization that constitutes so commendable a feature of current practice, and very few modern cars are fully built in the factories whence they derive their names, it being found the best of good policy to resort for certain parts to the parts manufacturers. In this way is gained the benefit of an experience much more extensive than could be secured in catering to a narrower field, and the result is good all around.

Standardization Brings Refinement in Detail.

Frames, axles, wheels, springs, bearings, controlling levers and pedals, lamp brackets, dashboards, etc., are chief of the important and less-important details that have been subjected to the refinement of detail resulting in standardization. And even in the cases where the manufacturer makes a point of building everything in his own factory, he at least makes many details conform to the standards established by the industry as a whole.

MAIN FLOOR OF GRAND CENTRAL PALACE, WHERE THE SHOW WILL BE HELD.

A number of the cars will be of particular interest to the technically critical, in that they present numerous examples of the new screw-and-nut standards established by the A. L. A. M., and at least tentatively accepted in many new models, regardless of association affiliations.

It is apparent that several minor features of automobile design are still in an unsettled condition. The six-cylinder engine, for instance, while considerably in evidence, and given an especial standing by its adoption by several of the foremost manufacturers, both American and foreign, nevertheless is adversely criticised by the more numerous advocates of four cylinders or less. Despite all this, its even mechanical balance, uniform torque, and superior self-starting qualities are certain to gain for it increasing use, especially if the question of cost be in a degree disregarded.

The single-cylinder engine, at the other end of the line, still makes good with the arguments behind it of the utmost simplicity possible, lowest cost, etc. Yet it is notable that almost every manufacturer of single-cylinder cars also makes multicylinder engines, from which it seems increasingly clear that the chief justification for the single cylinder is as the most obvious means of turning out a well-made car at a low price.

The long-heralded and widely-expected two-cycle engine fails to appear in the great numbers that were confidently predicted by the motor-wise last year, but the few concerns that do manufacture them show a business and engineering success that goes far to discount the failure of the newer construction to find wider acceptance.

Apparently it is the question of providing for the maintenance of the required crankcase compression, in a multicylinder two-cycle engine of the current type, that deters numerous engineers who might otherwise make some sort of a positive venture into this undoubtedly attractive field. Against this is the contention, of those most experienced and successful in the making of two-cycle cars, that they manage very easily to avoid all troubles whatsoever of the sort referred to.

Carbureters Only of the Best.

Few engineers and fewer users appreciate the tremendous obstacles with which the problem of carbureter design is beset, and it is only lately that it has become generally recognized that nothing less than the best carbureters possible can begin to serve their difficult purpose. This becomes very clear upon an inspection of the current models of cars, in which the hopelessly inadequate constructions of earlier seasons have given place to carbureters in which the best that is known on the subject is embodied.

The two established systems of ignition — jump-spark and make-and-break — seem to be warring as insistently as ever for supremacy, apparently without material gains on either side. Reliability with both types is improved by better design and more careful construction, and it seems to be generally appreciated that nothing but the most perfect materials can serve as a basis for a good ignition system. The use of the magneto shows a marked increase, both for high-tension and low-tension systems, and undeniably affords results that in many ways are altogether superior. Both the dynamo and storage battery retain their vogue, to the practical exclusion of the dry cell, except as a reserve or for starting, on the higher-priced cars. On the low-priced cars the dry battery still holds full sway.

Air Cooling and Water Cooling.

Both air cooling and water cooling have won converts during the season just passed, with the unfortunate result that nothing one way or the other is proved positively to the satisfaction of the man most interested—the user. Almost every powerful and expensive car utilizes water cooling, the foreigners, especially, failing to show even a single instance of the contrary practice. On the other hand, it is rather difficult to see anything very deeply wrong with a system of cooling that holds the transcontinental record of fifteen days from San Francisco to New York, and which proves eminently practical in the hands of numerous users.

Water cooling is improved, in that there is a tendency towards the use of larger piping and more liberal jacket spaces. On the larger cars the centrifugal pump seems to be favored over the gear pump, which suggests that these cars may to a considerable extent depend upon thermosiphon circulation at low speeds. The flywheel fan shows gains over the fan-behind-the-radiator con-

struction, with a consequent increase of perfectly tight bonnets. In several cases both kinds of fans are used, one supplementing the other.

Air cooling is of the two general types already well known—the air-jacket system, of which a western manufacturer is the foremost and practically the only exponent, and the ribbed, flanged, pinned, and otherwise-increased cylinder surface, acted upon by an unjacketed blast, which is used by the majority of manufacturers of air-cooled cars.

Ball Bearings Coming to the Front.

Ball bearings are beyond any doubt in the way of achieving a great victory. Discouraged by the failure of the bicycle type of ball bearing when applied to heavy service, there has been a very persistent tendency on the part of more conservative manufacturers to let all ball bearings severely alone, and to depend solely upon plain and roller constructions. With the development of the annular, nonadjustable ball bearing, however, and the application of the best modern alloy steels to its construction, this conservative sentiment has undergone a rapid change, and even the application of ball bearings to the crankshafts of powerful engines is now questioned, when questioned at all, from other standpoints than that of the duty under which the bearing is capable of standing up. Following the French and German annular bearings, there have been produced very satisfactory English and American bearings of similar type, one American manufacturer of cars even going so far as to build annular bearings in his own shops, depending upon an extensive experience with bicycle manufacturing to guard against the making of mistakes.

Of the roller bearings, the most successful are all of American manufacture, and one type of conical roller, and another in which flexible rollers are used—both distinctively American—are exceedingly successful, having been tried on enough cars and tested through enough seasons to prove their merit past any dispute.

Concerning the Matter of Gears.

The gearless car seems as far off as ever, if the attention paid to the refinement of change-speed gears be taken as any criterion. Judged from another standpoint, it seems not so remotely in the future, after all, when it is considered that practically every high-grade car made is capable of running ninety-nine one-hundredths of the time on the high gear alone.

The multiple-disk clutch has achieved further advances, and not a few of the 1907 models show it where previously cone or drum clutches were used.

Sliding gears have lost little prestige, despite the apparent inroads made by the planetary and individual-clutch constructions. It seems to be established that sliding gears made of the right sort of material are thoroughly serviceable, regardless of the assertion that they are "brutal engineering," and irrespective of the fact that they are practically worthless when made of poor material.

An exceptionally interesting change-speed gear appears on one of the 1907 American cars, to which it has been applied for two seasons. This gear may be described as a sliding-shaft gear, it being similar to the individual-clutch type, except that the loose gears are clutched positively to their shaft by a sliding pinion that passes through them, and, by meshing with internal gears within them, constitutes a jaw clutch similar to that by which the direct drive on high speed is secured in sliding gears of the ordinary type. The advantage of this gear is that the shock of speed-changing is caught equally around the whole circumference of the gears, with consequently reduced likelihood of breakage through careless handling.

Propeller-Shaft Versus Chain Drive.

The status of propeller-shaft versus chain drive seems about unchanged from previous seasons, both constructions having large and enthusiastic followings. The complete inclosing of all wearing parts is an advantage that cannot be denied in favor of the propeller shaft, but with large sprockets to lessen the angles of bending between chain links, and with properly constructed roller chains, the chain drive is far from being as bad as it has been characterized, besides which it has the sound engineering advantages that come with an unloaded rear axle.

The Steam Car and the Electric.

There is little to be said about the steam car, not because of any loss in its popularity, but because it is still confined to two or three makes, which are making their great success without radical modification other than is involved by increases in power. The most obvious conclusion following upon an inspection of the 1907 steamers is that the gasoline car must continue to improve materially if it is to maintain its present lead over steam.

The electric automobile continues to hold an undisputed sway for certain classes of town and commercial service. Its simple control and operation, its cleanliness, and the entire absence of noise, commend it to many, especially women, who have no occasion to make long trips, and who do not object to a slightly-increased operating expense. Largely because of the foregoing reasons, supplemented by the electric motor's tremendous capacity for taking overload, the electric truck and delivery wagon prove thoroughly useful in the hands of an ordinary class of drivers, for service that is regular and exacting.

The commercial car of steam and gasoline types is increasing in numbers, and, though it has not yet affected the use of electric commercial vehicles, all signs point to a decisive contest for supremacy at some time within the next few years.

The motorcycle still retains its place as the "poor man's automobile," which it is more than ever before because of certain obvious improvements in quality and reductions in price.

Accessories Are Innumerable.

More than ever before, also, the accessory manufacturers' name is legion, and the multiplicity of auxiliary devices inspired by the modern automobile would require columns for the briefest mention. Nothing short of the show itself can give more than a general idea of the accessories; it is enough to say here that by far the great majority of them are practical and useful.

Concerning tires, except for a tendency towards mechanical means of fastening, and occasional instances of the commendable removable-rim construction, there is little that is radical in evidence. Improvements seem to be more improvements in quality than improvements in form, and the generally-anticipated price reduction is less apparent than was expected.

BALTIMORE AFTER THE SCORCHERS.

Baltimore, Md., Nov. 26.—The official head of the blue-coated minions of the law in this city has decided to place a damper on automobile speeding. Patrolman Lloyd Norris has been equipped with a high-speed motorcycle, and has been stationed at the entrance of Druid Hill Park, which contains one of the best automobile speedways in the country, and here each pleasant afternoon Baltimore's society turns out to enjoy a spin, and consequently, Patrolman Norris and his motorcycle have been having strenuous times, and he has more than his hands full.

C. R. MABLEY'S TOUR TO THE CAPITAL.

C. R. Mabley, accompanied by Al Poole, who rode with Joe Tracy in the Vanderbilt Cup race, and two friends, recently made a tour from New York City to Washington in a 1907 30-horsepower S. & M. Simplex. Of his experiences he said: "The bulk of the roads were practically impassable, the mud and sand being over the hubs. We were in mud almost up to our hubs by the time we reached Lancaster, and did not suppose that we would have anything worse than that to encounter. But the roads kept getting worse and worse, and between Baltimore and Washington we found repairs going forward. We encountered a number of automobilists stuck in the mud, one of whom was enjoying the assistance of two mule teams. Oh, it was a delightful run."

GEN. GEO. MOORE SMITH,
Chairman and Secretary A. C. A. Exhibition Committee.

SAMUEL M. BUTLER,

COLGATE HOYT,
Pres. Automobile Club of America.

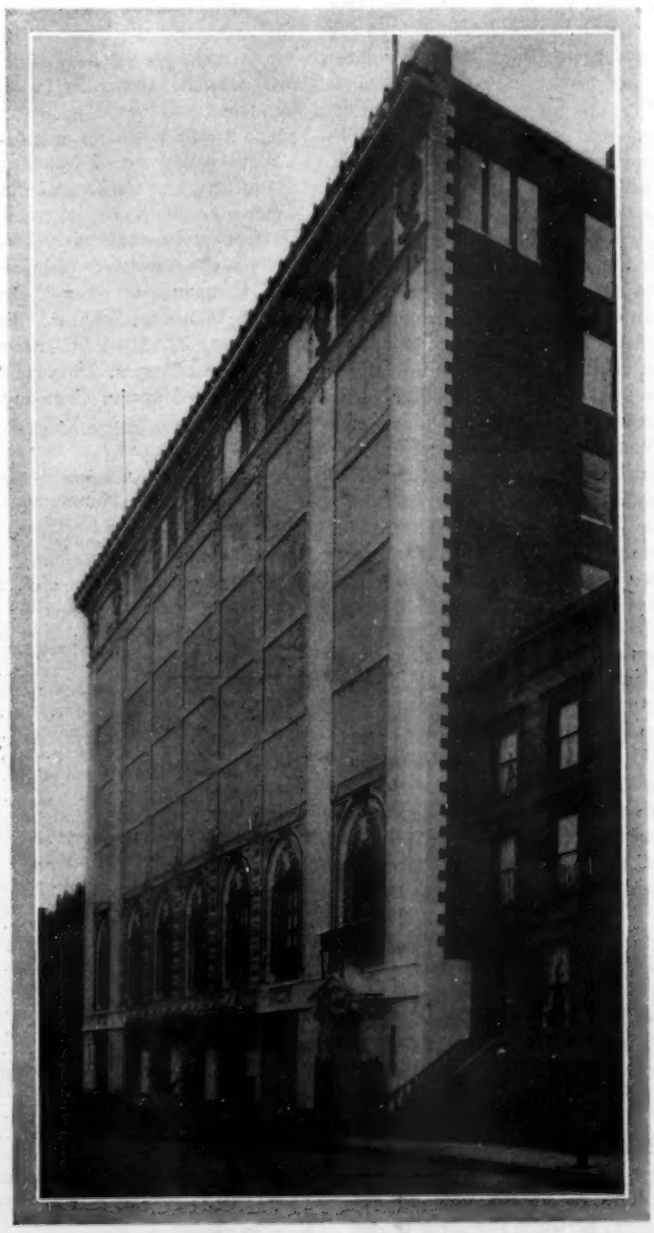
ALFRED REEVES,
Gen'l Manager A. M. C. M. A.

BENJAMIN BRISCOE,
Chmn. A. M. C. M. A. Show Com.

THE PROMOTERS OF THE PALACE SHOW

THE Automobile Club of America was the first club to be organized in this country as a result of the coming of the automobile. Several of those who attended the meeting at the Waldorf-Astoria still retain their interest in the club and are prominent in the conduct of its affairs. Being first in the field, the Automobile Club of America has been one of the leading forces in the progress of automobiling in this country, and was a factor in the formation of the American Automobile Association, the national body, which has influential clubs in all the large cities. The A. C. A. has prospered and grown until its full quota of 1,000 active membership has been reached, and it also has several hundred associate members. At the recent annual election Colgate Hoyt succeeded to the presidency, replacing Dave H. Morris, during whose two years' administration plans were effected and the work nearly completed in the building of the club's new palatial home on West Fifty-fourth street. This complete structure will be ready for occupancy by the opening of the year, and the A. C. A. will be able to boast of one of the finest clubhouses and the most up-to-date one for automobile purposes.

The conduct of the seventh annual exhibition is in charge of a show committee consisting of Gen. George Moore Smith, Alan R. Hawley and William Pierson Hamilton, with President Colgate Hoyt and Secretary S. M. Butler, ex-officio members. This same committee, with the substitution of Mr. Morris for Mr. Hoyt, successfully conducted the show of last January in the Sixty-ninth Regiment Armory, which was obtainable because the contractors had not turned the building over to the State. It was a matter of necessity rather than a question of choice in holding this year's event in the Grand Central Palace, but the increased interest in automobiling insures substantial results both to the exhibitors and to the promoters, among whom are many new names.



PALATIAL NEW HOME OF THE A. C. A. ON WEST FIFTY-FOURTH ST.

It is a matter of pride with the club to be a factor in the promotion of automobile shows, for it will be remembered that the organization was one party to the three-cornered arrangement under which the Madison Square Garden exhibitions were held for two consecutive years. The big garden became too cramped to provide properly for the entire industry, and when the A. L. A. M., naturally looking after its own interests, brought about a two-party understanding, the A. C. A. had the problem of providing elsewhere for all those of the industry who were then deprived of the opportunity of a Metropolitan presentation of their product. How well the A. C. A. has met the emergency is made evident in the notable show of last January and the promising one opening Saturday night at the Grand Central Palace.

Practically associated with the A. C. A. in the conduct of the Palace Show is the American Motor Car Manufacturers' Association, concerning which Alfred Reeves, the general manager, gives complete information on the following page. The A. M. C. M. A. has a membership of 39 makers, which promises to increase perceptibly with the growth of the industry.

The necessity for an open show is generally recognized, and it is also apparent that two shows must be held, for no one building in the metropolis, nor in any other city, is now equal to the demands for space for the entire industry, so wonderful has been its development in the past decade.

AMERICAN MOTOR CAR MFRS.' ASSOCIATION

By ALFRED REEVES, General Manager,

ON account of its activity and association with the Automobile Club of America in the promotion of the Grand Central Palace show, there is more or less interest among tradesmen and automobilists regarding the objects and the workings of the American Motor Car Manufacturers' Association, which was instrumental in bringing about the much desired early show.

Although less than two years old, the A. M. C. M. A., which was originally started by James Couzens, Benjamin Briscoe, and a few other prominent manufacturers, now has on its rolls thirty-nine manufacturers who are enjoying privileges that could not be obtained other than by the consolidation of interests of a mutual sort such as are to be found even among competitors. Without fostering any trust methods, the combination of thirty-nine builders following a free and open policy is doing much valuable work that ultimately benefits the agent and the individual buyer in the same ratio that it does the manufacturer.

Probably no object of the A. M. C. M. A. is more important than the interchange of ideas that tends to an improvement of the product and the standardization of parts which sooner or later reduces the expense of maintenance to the individual and must make the motor car more popular.

The American association last year was largely responsible for the independent show in New York, and has appeared again in connection with the show which opens on Saturday night and which is promoted by the Automobile Club of America, an organization that has always been working and continues to work to obtain the best for the trade and the pastime of motoring. Independent at all times, the club has persisted in its promotion of shows, in which it was the originator, and this year its affair at Grand Central Palace, with the participation and support of the A. M. C. M. A., promises to rival in magnitude and in the amount of business done anything that America has ever seen.

Some excellent work is being done securing responsible agents, and a few days ago there came from the press the most complete list of automobile agents, with the cars they handle and the garages which do not handle cars, that has ever been printed. These lists are not published broadcast, but are for the exclusive use of the members. Guarantees and discounts that are fair and uniform and a regular form of agreement with agents are among the other things that are proving beneficial.

Appreciating that advertising is the very life of trade, the Committee of Management encourages its members to use the daily and weekly papers, and by suggestion offers new ideas for the expenditure of advertising funds, the proper disposition of which has always been a problem not easy of solution. The policy is to encourage liberal advertising, but to guide it so that the maximum results may be obtained.

Committees within the association are working for a national law, so that a single license number taken in one State will answer in any State. Good roads, too, receive attention at the hands of a committee well versed in that vital necessity for motor car enjoyment. Hostile legislation and anything that savors of a strike are religiously fought.

Insurance, especially on testers and demonstrators and other forms of protection, is obtained for members under the best possible conditions, which conditions are not obtainable by individuals. Securing reduced freight rates, which naturally benefits the individual as well as the agent and manufacturers, is always a subject of importance, and in this connection the freight committee has been doing good work. Last year the association succeeded in having the railroads build a new type of freight car with a greater carrying capacity of automobiles.

Information on mechanical matters is sought for and disseminated at frequent intervals, and more work along these lines is being planned. Last Saturday A. E. Schwartz, of New York, was sent to Europe as a special representative of the A. M. C. M. A. to attend the foreign exhibitions, with a view of establishing agencies abroad in connection with the American invasion of the European market which is about due.

Plans are being made to open up new fields of trade. Patent matters come within the scope of the association in various ways. The formation of the Ajax-Grieb Rubber Company, makers of the Ajax 5,000-mile guaranteed tire, was brought about by members of the association.

The general opinion that the thirty-nine members are combined to fight what is known as the Selden patent is erroneous. No fight is made against the patent by the association, although the members, along with some forty other makers, do not believe in it. The Ford Motor Company, one of the leading members of the A. M. C. M. A., is fighting the idea single handed, in an effort to disprove the claims made.

It can be readily seen that the association benefits the maker, the agent and the buyer in the natural course of the acceptance by its members of the various plans offered and the advertising and publicity secured. The new poster by Pal and last year's handbook are looked upon as great "business getters," and other plans in preparation would indicate a promising future.

The Committee of Management of the American Motor Car Manufacturers consists of James Couzens, of the Ford Motor Company, chairman; A. C. Newby, National Motor Vehicle Company, vice-chairman; J. B. Bartholomew, the Bartholomew Company, treasurer; William Mitchell Lewis, Mitchell Motor Car Company, secretary; Benjamin Briscoe, Maxwell-Briscoe Motor Company, auditor; Charles Lewis, Jackson Automobile Company; W. H. VanDervoort, Moline Automobile Company; Charles E. Duryea, Duryea Power Company; W. C. Marmon, Nordyke & Marmon Company.

Following is a list of the members of the association:

Aerocar Company	Aerocar.
Acme Motor Car Company	Acme.
American Machine Manufacturing Company	Commerce.
American Motor Car Company	American.
Ardsley Motor Car Company	Ardsley.
Austin Automobile Company	Austin.
B. L. M. Motor Car Company	B. L. M.
Bartholomew Company	Glide.
Buckeye Manufacturing Company	Lambert.
Conover Motor Car Company	Conover.
Crawford Automobile Company	Crawford.
De Luxe Motor Car Company	De Luxe.
Detroit Auto Vehicle Company	Detroit.
Dolson Automobile Company	Dolson.
Dorris Motor Car Company	Dorris.
Dragon Automobile Company	Dragon.
Duryea Power Company	Duryea.
Evansville Automobile Company	Evansville.
Ford Motor Company	Ford.
Harrison Wagon Company	Harrison.
Jackson Automobile Company	Jackson.
Knox Motor Truck Company	Atlas.
Marion Motor Car Company	Marion.
Maxwell-Briscoe Motor Company	Maxwell.
Mitchell Motor Car Company	Mitchell.
Moline Automobile Company	Moline.
Moon Motor Car Company	Moon.
Mora Motor Car Company	Mora.
Motorcar Company	Cartercar.
National Motor Vehicle Company	National.
Nordyke & Marmon Company	Marmon.
Pierce Engine Company	Pierce-Racine.
Premier Motor Car Company	Premier.
Rapid Motor Vehicle Company	Rapid.
Reo Motor Car Company	Reo.
St. Louis Car Company (Auto Dept.)	American Mors.
St. Louis Motor Car Company	St. Louis.
Triumph Motor Car Company	Triumph.
Wayne Automobile Company	Wayne.

WHAT CONCERNS WILL EXHIBIT AND WHERE

WITH a big building crowded to its limit with several hundred exhibitors, embracing an industry that ranks second to none, the visitor to the Grand Central Palace requires a carefully classified list in order to enable him to learn the whereabouts of the particular feature that interests him most on his first call to look over the 1907 display. If he be an owner, undoubtedly he will be attracted by the new model of the car which he drives; or, having already ordered one, the tire problem may demand his attention; or lamps, speed indicators, lubricants, ignition, clothing, and various accessories may be that which he wants to find. Of course, a general survey of the whole show is generally made by the average visitor, but there are some men so busy that they limit their time and attend the exhibition with a definite purpose in view. Particularly for the convenience of all, as well as for the man who travels most of the time on high speed, the following classified list of all exhibitors will be found a valuable time-saver.

DOMESTIC PLEASURE VEHICLES

Abendroth & Root Mfg. Co.: Frontenac..Gallery 112.
Acme Motor Car Co.: Acme.....Main Floor 47.
Aerocar Co.: Aerocar.....Main Floor 17.
American Locomotive Auto. Co.: Berliet..Main Floor 56.
American Motor Car Co.: American....Main Floor 26.
Austin Automobile Co.: Austin.....Main Floor 37.
Berkshire Automobile Co.: Berkshire...Gallery 102.
B. L. M. Motor & Equipment Co.: B-L-M.Main Floor 48.
Buckeye Mfg. Co.: Lambert.....Main Floor 22.
Cleveland Motor Car Co.: Cleveland....Main Floor 9.
Conover Automobile Co.: Conover.....Main Floor 23.
Craig-Toledo Motor Co.: Maumee.....Gallery 110.
Crawford Automobile Co.: Crawford...Main Floor 20.
Daimler Mfg. Co.: American Mercedes..Main Floor 10.
Dayton Motor Car Co.: Stoddard-Dayton.Gallery 101.
Deere-Clark Motor Car Co.: Deere.....Gallery 133.
De Luxe Motor Car Co.: De Luxe.....Main Floor 18.
Detroit Auto Vehicle Co.: Detroit.....Gallery 121.
Dolson Automobile Co.: Dolson.....Main Floor 38.
Dorris Motor Car Co.: Dorris.....Main Floor 30.
Duryea Power Co.: Duryea.....Main Floor 15.
E. H. V. Co.: Compound.....Gallery 103.
Evansville Auto Co.: Evansville.....Main Floor 53.
Ford Motor Co.: Ford.....Main Floor 16.
Grout Bros. Automobile Co.: Grout.....Main Floor 51.
Harris, G. P.....Gallery 109.
Harrison Wagon Co.: Harrison.....Gallery 127.
Holsman Auto Co.: Holsman.....Gallery 131.
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Johnson Service Co.: Auto-Carriage....Gallery 105.
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Lansden Co.: Lansden.....Gallery 126.
Oscar Lear Automobile Co.: Frayer-Miller .....Main Floor 44.
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National Motor Vehicle Co.: National..Main Floor 41 and 43.
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Premier Motor Car Co.: Premier.....Main Floor 4.
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WHAT THE TIRE MAKERS WILL HAVE TO OFFER

THIS year's display of tires will not merely be a larger one than ever before, showing progress in demand, but more than all it will furnish a spectacle in the almost universal display of the mechanically fastened tire with frequently a "universal" rim. Where in the previous two shows this type of rim, that removes all terrors of roadside repairs, was shown with somewhat of an apology tinging the display and the explanation of its merits, this show will herald it forth proudly.

Pennsylvania Rubber Company.

Radical departures in construction of either racing or wrapped tread types will not be found at this display, but important additions will be furnished in the new removable rim and the non-skid tires to be shown. The removable rim is an advance on anything yet shown from abroad in the dispatch with which it can be handled. Two bolts, which extend through the felloe against the clincher rim, are first loosened. The tire and rim are then turned for about an inch on the wheel to disengage the detents from the slots in which they rest, and the rim and its tire are then slipped off sidewise. The non-skid tires have the studs bedded in several layers of fabric inside the tire proper. The studs then extend through the rubber tread and then through a strip of leather on tread proper, this strip acting to securely hold the stud heads.

Firestone Tire & Rubber Company.

While solid tires have been the strong card with this concern, they will not occupy an exclusive position, as there will also be a general line of pneumatics. The Firestone side-wire tire is constructed with cross wires vulcanized near the base. Resting on the shoulders thus formed are the two endless retaining wires. This tire has a new application in two single tires in one channel. This gives four wires for fastening with less pinching tendencies under pressure. The reflex of these conditions means greater resiliency and less heating under friction, as the space between their bases gives freedom for escape under pressure of load.

G & J Tire Company.

The specialty to be shown will be the oval raised tread tires identified under this company's trade-mark in both the G & J and the Indianapolis Dunlop styles. The construction of these tires is made on the basis that the combined strength of the various

layers of fabric is not utilized unless all layers are on an equal tension and act in harmony. The claim made for the cross section thus brought about is that the tire has more frictional contact with the road, both under ordinary conditions and when the car is turning a corner. This design is adhered to for 1907, as it permits the tread to spread, the shape being made with the idea that it practically eliminates all flexing at either side of the tread.

Hartford Rubber Works Company.

All the products of the Hartford factory will be shown, including a number of new features. There will be the new turnbuckle, which will be fitted regularly for 1907, taking either Dunlop or clincher types. In this turnbuckle it will be found that a square-end crank wrench takes the place of the former round-end key. In the solid tire division will be found a departure in the form of a spiral wire base for commercial vehicles. As an additional option equipment these same tires will be fitted with a wire anti-skid tread. The latest novel feature of the entire Hartford product will be also shown. This is the wire grip, flat tread, non-skid pneumatic tire. This has never before been on exhibit.

Swinehart Clincher Tire Company.

The product to be shown will display the regular concave Swinehart tires and the new Pyramid pneumatic tire. There will also be samples of the twin-truck tires with an endless cable lying between the two treads. This cable is used as an anti-skid device to at the same time increase the traction and to hold the tire securely to the rim.

International A. & V. Tire Company.

This tire exhibit will consist of clincher tires in molded treads, wrapped treads and Bailey treads, as well as a tire to be used on a special detachable rim. This latter tire is to be used without lugs, and it is claimed for it that a quick removal can be made without the use of tools.

Morgan & Wright.

A new flat-tread tire will be shown under the title of the De Luxe, and special stress will be given to the exhibit of the Universal rim with its improved turnbuckle. The new turnbuckle, in addition to its inner right and left thread, has a peripheral worm thread, and sets in a square-jawed Y-shaped carrier, the stem of which projects below the rim. In this stem is the worm-driver with a squared central opening for the end of the operating crank. The tightening and loosening of the turnbuckle being a worm drive, the device is self-locking. The beads will continue to be reversible for either clincher or Dunlop.

B. F. Goodrich Company.

To anyone desirous of keeping in touch with all betterments pertaining to the tire industry, this exhibit of quick detachable tires and rims offers opportunity for interesting investigation. There will also be shown the regular clincher type of tire in smooth, flat and Bailey treads, the method of construction and the reputation of the makers making them worthy of attention, rather than any newness of design or construction. To the commercial motor-wagon maker and user, the display of solid rubber side-wire tires will be no less attractive.

Michelin Products Selling Company, Inc.

This famous French tire will be shown, together with a complete display of tire accessories. In tires there will be shown the flat-tread racing tires, the round-tread tire and the anti-skid-tread tires that were such a factor in the recent Vanderbilt cup race, together with the removable rim type that has sprung into prominence from its time-saving factors in the prominent road races here and abroad. In accessories there will be a complete line covering every need for roadside or garage repairs.

St. John Rubber Tire Company.

The solid rubber cushioned tire made by this concern will be shown in its various sizes, with prominence given the claims made for the construction in the exhibit of a White steamer which, it is stated, has been driven 18,000 miles on one set.

Electric Rubber Manufacturing Company.

The novelties to be shown are the Traver blowout patch and the M. T. triple strength inner tubes. The exhibit will be completed with the Panther wrapped tread casings and regular gray and red inner tubes. The blowout patch is for use betwen the inner tube and the casing and is moulded to a sleeve shape of built up construction with a binder around its edge.

Continental Caoutchouc Company.

In addition to the complete showing of the tires made by this German factory a feature will be made of the new steel studded anti-skid tires known as the Rouge Ferre. This is steel-studded, made in black and red rubber, with the studs so imbedded in the rubber that they become an integral part of the tire against loosening or flying out.

Diamond Rubber Company.

There will be a complete display of pneumatic and solid tires, the latter in single and twin treads and the former in the wrapped tread as used in the Vanderbilt Cup race. Chief interest will center in the Marsh rim for quick detachable tires. The most notable point of difference between the Diamond wrapped tread quick detachable tire and the regular Diamond clinchers is the flap in the casing of the former. The Marsh rim has a removable flange retaining the casing and held in place by an outwardly expanding U-shaped locking ring engaging an inwardly projecting bead on the rim body. This ring is held in place by expansion against a shoulder on the removable flange, and is further secured by a small locking wedge held by a nut. The rim will take any standard clincher tire. It is readily removed.

Harburg Tire Company.

This German-made tire will be shown as an example of an automobile tire for which it is claimed that, owing to its construction, the rubber cannot separate from the canvas no matter what happens, even though it be a cut from contact with a sharp object. The further claim is that in sixteen months use on a 60-horse-power car the tires were worn to the canvas, were recovered and worn out again.

Goodyear Tire & Rubber Company.

The Goodyear universal rim will be shown for use with either the Goodyear type of tire base or the regular clincher tire beaded edge base. The two lips of the base on the company's own type of casings have piano wires interlaced and vulcanized in place, forming wire tape rings. When the casing is in normal condition the two rings tend to lengthen, giving ease in removing or replacing the casing on the rim. When air pressure is applied the wire tapes expand sidewise, thus contracting in their length and seating the casing on the rims. Standard clincher tires will also be shown, also solid tires that fit the company's universal rim.

Fisk Rubber Company.

The first of the mechanically fastened tires will be shown in its familiar form and with several treads to meet the modern demands. The method of securing the casing on the rim by cross bolts passing through washers that hold the rings overlaying the beaded edges is retained in its general detail as heretofore.

Ajax-Grieb Rubber Company.

The Ajax tire will be shown as supplied to many of the members of the American Motor Car Manufacturers Association, along with the numbered certificate of guarantee that goes with each correspondingly numbered tire, insuring the buyer of at least 5,000 miles of riding.

THE AERO CLUB AT THE PALACE SHOW

THE Aero Club of America will figure in great degree at the Grand Central Palace Show. In the past year the club has made great strides, and its activity is of a decidedly international character. In the Palace exhibit everything new and novel in the aeronautic line, from aeroplanes to flapping-wing machines, will be seen in conjunction with the immense gas bags with which the club members have made twenty-seven actual ascents during the year now nearing its eventful aero close.

Lieutenant Lahm will exhibit his balloon, *United States,* which won the recent International race for the Gordon Bennett cup. The Aero Club will show *Centaur* and *Orient,* with which successful ascents were made from Pittsfield a short time ago, and the Santos-Dumont airship *No. 9.* Dr. Julian Thomas is expected to add his two balloons, *Nirvana* and *America,* to the list.

Of still greater interest will be Roy Knabenshue's new aeroplane and motor, which weighs only a trifle over three pounds for each horsepower developed, and is to be shown in public for the first time, and the Langley engine, which develops an even larger power for its weight. The Langley engine is being exploited by the Smithsonian Institute. Leo Stevens has entered his balloon *California Arrow,* and will show two new airships also, of which much is expected.

Other exhibits will be Henry Rodemeyer's *Flapping Wing,* with which an attempt is made to imitate the flight of a bird, and G. Curtis Gillespie's two full-sized flying machines. Interesting models of airships and aeroplanes have been entered by Carl Hartman, of Windfield Junction, N. Y., and Miss E. L. Todd, of New York. The Curtis Manufacturing Company, of Hammondsport, N. Y., has a wind wagon with a fan propeller, and Professor Pickering, of Harvard, will show a bicycle which he propels by a somewhat similar means. Added to these novelties will be a great variety of motors and propellers designed for use in the battle to overcome the laws of gravity.

M. Santos-Dumont, who prefers to navigate aloft under the Stars and Stripes of the Aero Club of America instead of using the tri-color that might harmonize with his Parisian residence, will not be here for the Palace show, but some of his aerial successes will be illustrated in the vitagraph motion pictures that will be shown. Recently the optimistic Brazilian said:

"We can look forward to a practical aeroplane which can be comfortably housed in every home. From the standpoint of maintenance, the cost, both of petroleum and repairs, the aeroplane will be much less expensive than the auto car. Next year people will be able to go to the seashore on their aeroplanes. It will become the fad and the commencement of a new industry."

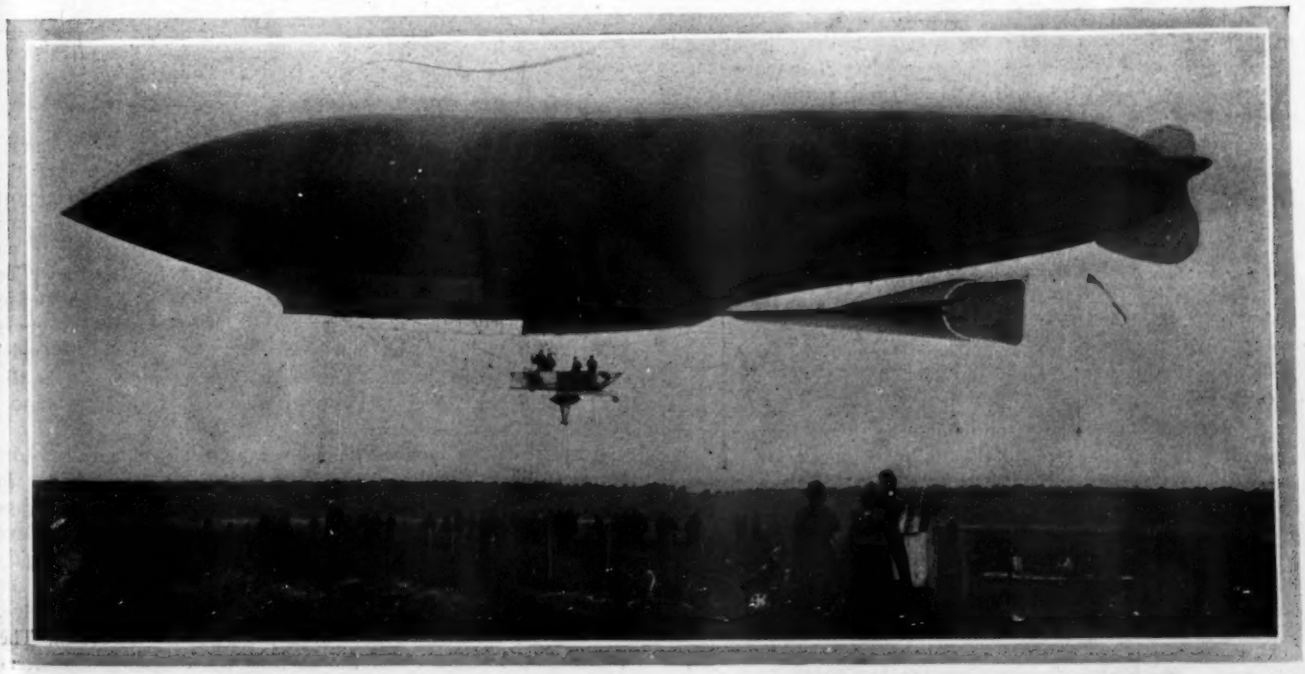
THE DILEMMA OF THE WRIGHT BROTHERS.

PARIS, Nov. 28.—The *Herald's* European edition publishes the following leader under the heading "Messrs. Wright Have the Opportunity to Obtain Money and Fame in the *Daily Mail's* Aeroplane Contest. Will They Seize It?"

"Whatever may be the practical value of the Wrights' aeroplane it must be acknowledged that the two brothers have succeeded in focusing the attention of the aeronautical world upon themselves and upon Dayton, Ohio. First, as justification for secrecy, Messrs. Wright explain that 'there is nothing patentable about their machine, and that as soon as it is seen by experts it will be duplicated and practically opened to the world.' Nevertheless, the brothers Wright are willing to compete for a prize of $100,000 for four flights of fifty miles each.

"A single flight would enable the Wrights to win half that sum to-morrow, as our active contemporary, the *Daily Mail,* has offered a prize of £10,000 to any one who may succeed in going by aeroplane from its London office to its office in Manchester.

"It is gravely assured that the French government has obtained an option to purchase the Wrights' invention for 1,000,000f. after it shall have made a successful test flight of fifty kilometers. But, 'there's the rub.' The test flight naturally must be made before experts representing the French government. Now, Messrs. Wright confess that their secret will cease to be a secret the instant experts see the aeroplane. Thus they are on the horns of a dilemma. Unless they show the machine in a test flight of fifty kilometers the French government will not purchase it."



THE LEBAUDY DIRIGIBLE MILITARY BALLOON "PATRIE," WHICH HAS JUST BEEN ACCEPTED BY THE FRENCH GOVERNMENT.

On Tuesday, Nov. 27, the dirigible *Patrie* started from the balloon shed at Moisson, just outside of Paris, and returned to the starting point after covering a distance of nearly 60 miles. In point of speed and endurance, it met the conditions imposed by the French Minister of War.

BRITISH SHOW ECLIPSES ITS PREDECESSORS

By JOSEPH A. MACKLE.

LONDON, Nov. 17.—The first of the shows opened its doors at the Olympia, Hammersmith, Thursday morning. No official opening took place, and, although both King Edward and the Prince of Wales are patrons, no attempt was made to secure the additional éclat which would result from a formal opening by one of them. The exhibition at Olympia is controlled by the Society of Motor Manufacturers and Traders, a body which comprizes practically the whole of the British motor industry. It will be remembered that last year a trial was made of holding the show before the Paris Salon, with the special object in view of securing for British makes and agents that large proportion of orders which would otherwise be placed at Paris in December. The experiment proved a great success, and November will be the future date for the show.

All French and Italian Makes at Olympia.

Nearly all the 1907 French and Italian models are on view, and, if the present prospects of business are realized, the show will certainly class as the best yet held in Britain. Upwards of 300 firms are exhibiting and over 150 makes of cars are on view, yet there was not room for all. The demand for space this year has caused the exclusion of commercial vehicles and motor boats; these will have an exhibition at Olympia in March.

From the spectacular point of view the present show ranks well ahead of any of its predecessors. A high artistic level has been aimed at in the design of most of the stands and some very pretty effects have been realized. The Mercedes stand is a creditable production, composed of stained oak scroll work studded with electric lamps. Railings of the same style surround the exhibits and a very pleasant *tout ensemble* is the result. The Panhard style of green painted wood is agreeable to the eye and the festoons of crystal electric lamps adorning the Napier exhibits produce a striking effect. White steamers have an effective staging, and in fact the majority of this year's stands surpass the best of previous years.

A walk round the show—and a lengthy process it is—reveals a dazzling succession of colors, indicating the big improvements noticeable of late in the bodymaker's art. Indeed, improvements in body construction are far more in evidence than alterations in the design of the chassis, and it seems clear that makers have settled down more or less to their several standard types of construction and are now devoting their attention more to detail improvements with the immediate object of increased simplicity and accessibility.

Racing Cars Are Much in Evidence.

There is the usual sprinkling of racing monsters to provide interest. Duray's big Dietrich is there, decked with a laurel wreath and the tricolor, and much more business-like does it seem than the gaudy-painted Renault which carried off the Grand Prix. Even the 200-horsepower Darracq has been painted up and now looks quite tame and respectable.

With horsepower from 60 down to 6 and prices ranging from $500 to $6,000, every type of automobile is there; the little two-seater for the shopkeeper and the Pullman tourist for the millionaire. In this latter class must certainly be placed the 30-horsepower Daimler for the Nizam of Hyderabad, a huge yellow seven-seated saloon, with a most extensive list of fittings. The Princess of Wales' 35-horsepower Daimler bears it company, and, to judge from the half dozen specially built cars on view, it would seem as if the whole of the British aristocracy are fast becoming autoists.

No Revolutionary Changes in Design.

Revolutionary changes in design are conspicuous by their absence, and one looks in vain for any sudden innovation such as was witnessed last year in the general production of low-powered and low-priced four-cylinder cars. Next to the six-cylinder boom referred to later, the most interesting feature is the reduction in price for the higher-powered cars of several big firms. Daimlers have lowered prices by a substantial amount and Argylls are staging the same models as last season at a $300 drop in price all round. Unfortunately for the general spread of automobilism, the same reductions have not been made in lower-powered cars, and so their general adoption by the average individual is deferred. The leading British makers of medium cars are retaining the same models for 1907, but, on the other hand, several firms are abandoning the production of well tried and successful models of moderate power and are devoting their attention to higher-priced cars.

Guarantees Now Average Six Months.

It is only to be expected that with the industry settling down to standard lines the matter of maker's guarantees should receive further attention. The majority of makers of repute will now back up their workmanship for a period of six months at least, and, following on the Napier announcement at last show of a two years' guarantee, the Speedwell firm is prepared to look so far ahead as five years—somewhat an unwise proceeding, in view of the big deterioration which is bound to occur in even the best of cars after several seasons' hard running. While the usual guarantee provides only for replacement of the defective part, the Adams Motor Company enter into an agreement to keep their cars in a state of thorough repair for a period of six months from purchase, even if inexperienced driving has been the cause of the trouble.

Two Steam Cars and One Electric.

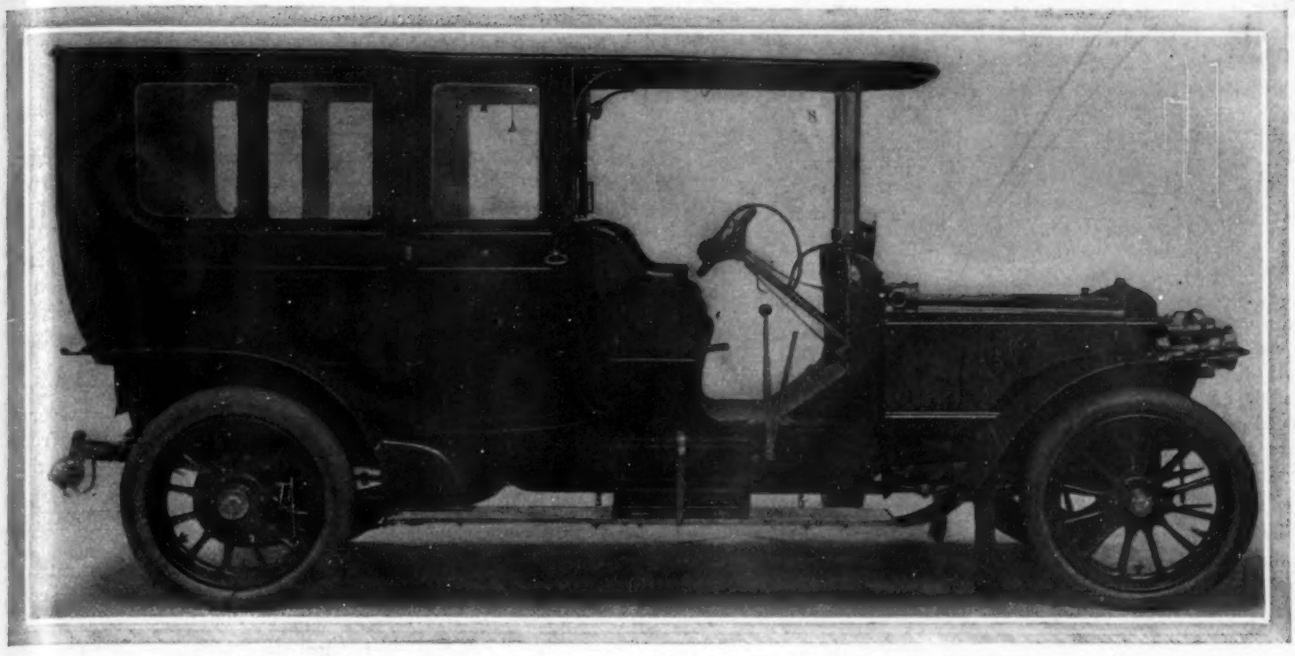
The gasoline engine still keeps ahead of its rivals, for the White and the British Turner Miese are the only examples of the steam car on view, while on one stand alone are electric vehicles staged. The much-vaunted gasoline-electric car has not yet materialized. Four-cylinder engines are adopted even in models of 10 to 12 horsepower. Two-cylinder cars are dropping out of favor and it now seems a matter of one cylinder or four for the average car.

The Prevalence of the Six-cylinder.

In the higher powered section, embracing cars of 30 horsepower and upward, a marked and growing tendency toward the adoption of the six-cylinder engine is manifest. On almost every stand there is staged at least one car of this type, some showing signs of careful design, but many having merely an extended crankcase and two extra cylinders bolted on top. The Napier firm has probably devoted more time and attention to this type of car than any other maker, and for 1907 no others than the six-cylinder cars will be made. The six-cylinder model is now coming within the reach of the moderate motorist by the provision of such cars as the 30-horsepower Horbick, at $2,500, and the 15-horsepower Standard at $1,375.

As regards the engines themselves, the general practice now seems to lie in the direction of separately cast cylinders, but in six-cylinder engines casting in pairs is common and in the case of the Rolls-Royce two sets of three cylinders cast together are found. Four cylinders cast in one piece are not in favor, only the Deasy and the Straker-Squire following this practice. In but a few cars of low powers does the horizontal engine survive, and in these cases America is usually the country of origin. The Wolseley Company, which for so long were staunch supporters of the system, have now finally adopted the vertical engine.

The automatic inlet valve is quite extinct, and in the majority of cases both valves are now placed side by side and worked



DAIMLER LIMOUSINE FOR THE NIZANI OF HYDERABAD, EXHIBITED AT THE OLYMPIA SHOW, LONDON.

off the same camshaft. Overhead inlet valves, worked by rocking levers, are dropping out of use. On the Straker-Squire and Deasy cars the valves are inclosed to keep out dirt and dust, doors providing access to them. The Daimler cars, on the other hand, have the valve cams and gearing quite exposed, a somewhat unnecessary pandering to simplicity.

Magneto ignition has won its way to popular favor and the majority of cars on view are fitted with the high-tension variety, low-tension magneto and internal make-and-break being less common. A duplicate system with coil and storage batteries is frequently provided. No new ignition systems or magnetos are to be found.

Self-starting Device Only On the Fiat.

In view of the general interest excited by the self-starting competition at Paris last winter, devices of this type might have been expected, but on the Fiat cars alone is such provision made. Here a special air compressor and storage tank enables the engine to be restarted after a stop and tires can be inflated by this same device. The cars of the New Engine Company have a handle on the dashboard connected by chain to the engine, by means of which the driver can start the engine without dismounting from the car. Another interesting feature on this car is the automatic spark advance and throttle control, both worked by the engine itself.

The honeycomb radiator has been almost entirely displaced by the gilled tube system and fans placed immediately behind the radiator are preferred to the flywheel fan. On the Mercedes cars both fans are used and the distinctive type of airtight bonnet so long fitted on these cars is now departed from in the 1907 models. The thermo-syphon system of water circulation finds fresh adherents, the 40-horsepower six-cylinder Minerva and the six-cylinder Belsize being examples of high-powered cars which find the method satisfactory. Where pumps are used these are invariably gear driven and the centrifugal type is less popular than the gear variety.

Metal-to-metal Clutches in Favor.

The leather-faced cone clutch is having a hard fight with the metal-to-metal variety, this latter existing in many forms. Internal expanding clutches are frequently found, but the disc type is fast coming into favor. The Hele-Shaw clutch, with its many plates of steel and phosphor bronze, is now standard on many British cars, and on a Mors car in the show was an interesting type of hydraulic clutch. This clutch and speed controller consists in effect of a rotary pump circulating oil within itself. The pump is formed by the flywheel, which acts as a casing, and the blade wheel within it is connected to the driving shaft for transmitting the power to the axle. So long as the delivery from the pump is unrestricted, oil circulates freely within the casing, but as soon as the delivery is more or less throttled by the movement of the controlling valve, the casing rotates the blade wheel. Upon the delivery of oil becoming entirely stopped, the motion of the casing is transmitted to the blade wheel at practically the same speed by reason of the incompressibility of the liquid. Under these conditions the blades are locked mechanically in their extended positions so that there is now a positive engagement betwen the driving and driven portions. The clutch, known as the B. J., is simple in construction and occupies but little space, a 40-horsepower clutch being but 14 inches in diameter.

Shaft Drive Gains in Popularity.

The big question of chain drive versus shaft and live axle is being slowly settled in favor of the latter type. Even such a firm supporter of chains as the Daimler Company now list a 17-22-horsepower chainless model and Crossleys do likewise. The smoothness of running, silence and better appearance of the shaft drive have been points greatly in favor of this type, and almost the only improvement which could have been adopted with a view to the popularizing of the chain drive—the provision of effective dustproof chain cases—has been entirely neglected save with the British Sunbeam car. On this car the chains run in oil and the extra silence thus obtained well repay the additional cost. Several important firms this year stage models to which either chain or shaft drive can be fitted with but little alteration—Napier, Crossley and Austin being notable examples. The Dennis and Lanchester cars adhere to the worm drive which they have proved to be so successful, and several new firms have followed this practice after making exhaustive tests.

Plain Bearings Still Seem to Survive.

A year ago the general adoption of ball bearings throughout the car was predicted, but plain bearings still seem to survive

for both engine and gearbox. For road wheels, however, ball bearings are generally used.

The increased flexibility of the modern engine, which enables most of the running to be done on top speed, does not seem to have caused any reduction in the size of the gearbox. Four speeds forward are to be found on most cars over 24 horsepower, three speeds being considered sufficient on lower-powered models. The epicyclic form of gear is slow in gaining popular favor and the sliding gear type remains the general practice. Direct drive on top speed is not now so evident as at last show, many cars having either four indirect speeds or else direct drive on third speed, on which most of the running will be done, and an indirect fourth speed, geared high for use on open roads and down grades. The Berliet and Pilain cars have direct drive on both third and fourth speeds, obtained by the employment of double bevels at the differential. The selective type of change speed gear, with gate quadrant, is now used even on low-powered cars, and the undoubted advantages of the system are appreciated by drivers.

Brakes Have Received Much Attention.

Brakes have received full attention, and it now seems the fashion to reverse the usual order of things by operating the rear hub brakes by foot pedal, the hand lever controlling the shaft brake. This is a wise plan, in view of the great strain imposed on the differential when the foot brake, as formerly fitted, was jammed on hard. On the Deasy car the rear hub brake drums are nearly half the diameter of the road wheels. Watercooling of the braking surfaces does not grow in favor, but Mercedes and several other big makers retain this custom.

Mechanical Lubricators Generally Adopted.

Police prosecutions are usually regarded by autoists as unnecessary and as productive of no possible good. One exception to this rule must be noted, for the frequent fines inflicted on drivers during the last year for permitting their cars to smoke at the exhaust are probably now the immediate cause of the general adoption of mechanical lubricators so noticeable at this present show. Generally automatic force pumps deliver a predetermined quantity of oil to the engine at each stroke and excess of oil cannot collect in the crankcase, since it is from here that the pump draws its supply after due straining. The Napier cars have an overflow system to keep the oil at a certain level, and on the Vauxhall cars oil is forced through the hollow crankshaft to the connecting rod bearings and piston faces. But of these many attempts some general system will eventually be evolved which will prove entirely satisfactory.

Shorter Wheelbases Are in Vogue.

Difficulty in turning and maneuvering in traffic has been alleged against the long wheelbase which was so general on the 1906 high-powered models, and in consequence there is revealed at the present show a tendency toward a shorter chassis. The reduction in length has been effected by the provision of a shorter bonnet and the shortening of the space between the front and rear seats. An instance of the attention paid to the comfort of passengers is the adoption of luggage carriers at the rear which either fold up or slide beneath the body when not in use.

The lubrication of spring hangers has received the attention which has been lacking before, and on several cars transverse springs are provided at the rear. The Deasy car has a front transverse spring and, contrary to what might be expected, this is stated not to cause any rolling motion.

Shock absorbers to prevent bouncing on rough roads are standard fittings on De Dietrich and Metallurgique cars.

The undue raising of dust by cars is a point to which attention will have to be paid in the near future, and Daimlers seem to have made themselves pioneers in this direction. On the 1907 Daimlers the fuel tank, formerly at the rear, scooping up the dust, is now placed under the driver's seat, and also both engine and gearbox have been raised in the frame somewhat to give additional clearance from the road. Many cars are now fitted with smooth metal under shields extending from the engine to the rear axle and, if these are properly designed, dust should be less prominent. Mudguards have received increased attention and no openings are now left anywhere for mud to reach the carriage work.

Limousines Which Can Be Easily Opened.

As to bodies, the tonneau is almost quite extinct and even the lowest powered four-seated cars glory in the side entrance. The recent Town Carriage Competition has doubtless served to cause a growth of popularity of the covered motor carriage and every conceivable variety is staged. From present indications it would seem likely that in place of a touring car with cape hood a type of covered limousine which can be easily opened out for country use will be the general favorite for 1907 season.

REPRESENTATIVE BRITISH CARS AT OLYMPIA

LONDON, Nov. 17.—Comparisons are odious, and, with the general excellence of the exhibits, it is difficult to make a good selection without omitting mention of makes equally sound. The old and annual statement that the British car now equals its French rival is again renewed with full vigor this year, and indeed there are good grounds for this belief. In all classes and styles there are to be found British cars of such design and workmanship as to leave no valid reason for the placing of a single home order for a foreign car.

Napier Which Only Makes Six-cylinder Cars.

In the highest ranks of the industry the struggle for supremacy lies, perhaps, between Daimler and Napier. The six-cylinder firm so proudly felicitate themselves on the adoption of the six-cylinder principle by some seventy other makers. Four-cylinder cars will no longer be constructed at Acton, every effort being devoted towards the perfection and standardization of the Napier specialty. Models remain practically unaltered for 1907 season, nor have prices lowered, as might be expected to follow from the action of other big firms.

Standard models are 40 and 60 horsepower, in each case the cylinders being cast in pairs with interchangeable inlet and exhaust valves on the same side of the engine and operated from the one camshaft. The synchronized ignition system has been further improved and is confidently regarded as trouble-proof. The system of lubrication provides an oil pump, direct driven, which forces the oil to the main bearings under pressure, whence it falls to the oil well. An overflow in the crankcase prevents the accumulation of excess of oil, and the undesirable emission of smoke should be a thing of the past. The metal cone clutch is retained and the expected disc type has not materialized. The faces are automatically oiled when the clutch is withdrawn and easy starting is secured. Careful attention has been paid to the springing, a rear transverse spring and shock absorbers being fitted. Three speeds forward are considered sufficient and the gate quadrant has not been adopted in the usual manner. The transmission shaft and differential run on ball bearings, and the road wheels are similarly provided. At the same price the purchaser is offered the choice of chain or shaft transmission. The 60-horsepower model is substantially the same in details and the

principal attribute of the stand is the absence of novel features of interest in the construction of the chassis.

Daimler Prices Somewhat Reduced.

Daimler's prices have come down, as was expected on the recent publication of their annual balance sheet, disclosing a huge profit on the year's working. Only in details do the cars differ from last year's types. The cylinders are cast in pairs, and four cylinders and chain drive are alone used except in the case of a new 22-horsepower model, on which the shaft drive is to be found. A pressed steel frame, with tubular cross members, replaces the reinforced flitch plate of last year, and to minimize the dust the engine has been raised in the frame. The gearbox has also been raised and the secondary shaft has been placed above instead of below the main shaft, providing additional clearance from the road. The radiator has been increased greatly in size and both pump and circulating pipes are of increased size. An extension of the crankshaft carries the sliding portion of the clutch, and with the double universal joint between clutch and gearbox, secures alignment.

A leather-faced cone clutch is still used, also four speeds forward and reverse, operated by a novel system of gate quadrant. Magneto is not yet a standard fitting on these cars, but can be supplied as an extra. The Daimler stand is a center of attraction, and doubtless the coming season will be as prolific with profit-bringing orders as was 1906.

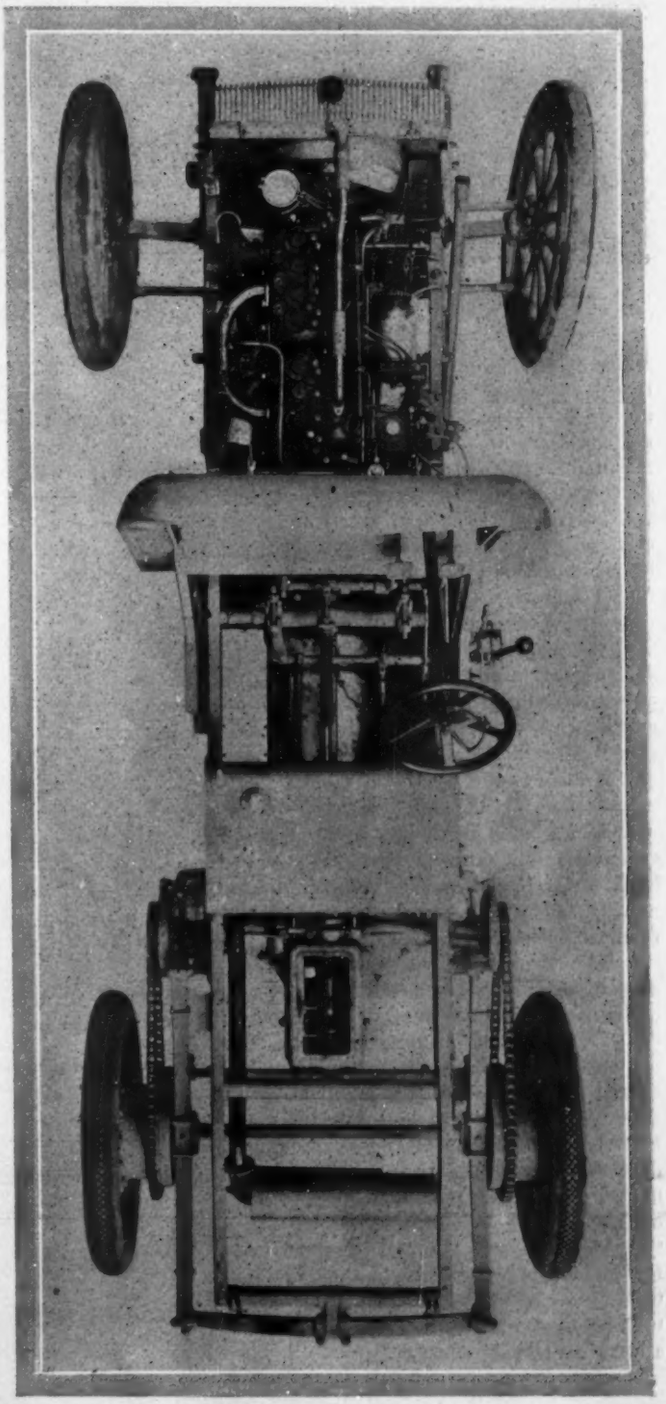
Wolseley Has Given Up Horizontal Type.

The Wolseley Company make a notable departure by the abandonment of the horizontal type of engine. All their cars will be known as Siddeley models and are rated at 10, 15, 18, 30, 40 and 45 horsepower, surely a sufficient selection to please every one. The 15 and 30-horsepower cars will be driven by live axle, the others having side chains. The 45-horsepower car is a new six-cylinder model, with cylinders 4 5-8 x 5 inches, cast in pairs and running at a normal speed 1,000 revolutions per minute. The valves are on one side, worked off the same camshaft, and variable lift is provided for the inlet valves. High-tension magneto is standard ignition, and the clutch is metal cone running in oil. Four forward speeds, with direct drive on third, are controlled by a gate lever. The differential is inclosed in the gearbox, and side chains convey the power to the rear wheels. The chassis price is listed at $4,400. The great feature in all the models is the practice of using interchangeable parts wherever possible, and the 15 and 18-horsepower and the 30 and 45-horsepower models are related in this manner, differing only in the number of cylinders.

Deasy Four-cylinders Cast in One Piece.

A new car which should prove a success is the Deasy, the production of Designer Lewis, who has the Rover cars to his credit. The four cylinders of the 24-horsepower engine are cast in one piece and the valves are all on one side, covered in by an easily-removed inspection plate. The top half of the crankcase is cast in one with the cylinders, with three ball-bearing journals fixed in it. Large plates on the side of the crankcase allow the pistons and connecting rods to be inspected or withdrawn without dismantling the engine. A clever arrangement of valve mechanism enables the engine to be used as a powerful brake. Air is taken in on the suction stroke and afterwards compressed. This compressed air is immediately released by the exhaust valve opening one stroke ahead of its usual time. The work absorbed in this operation causes a powerful braking effect to be obtained. The rear axle is remarkable for a large differential casing and tubular extensions, on which the road wheels run. Very large brake drums are attached to the rear wheels and give the car a peculiar appearance. The gearbox, controlled by a lever with zig-zag movement, has three-point suspension, as has also the body, suspended at the front on a transverse spring. A novel feature is the adjustable steering column, which can be altered to suit the convenience of the driver.

Somewhat similar features are adopted on the Rover cars, cylinders cast together and multiple disk clutch being found even on the lower-powered models. The 12-horsepower four-cylinder car supplies a well-defined want and is sold at the reasonable figure of $1,500. The novel single cylinder 8-horsepower car was introduced two years ago and, unchanged, it will be a leading



CHASSIS OF THE 1907 DAIMLER.

line for 1907. A 6-horsepower single cylinder runabout is listed at $650, with three speeds and reverse, and its capabilities for hard work are surprising.

Argyll of "Biggest in the World" Works.

The Argyll Motor Company, with their newly opened "biggest in the world" works at Alexandria, Glasgow, have discontinued the manufacture of their 10-12-horsepower two-cylinder model,

and center their attention on a 14-16-horsepower four-cylinder car. Practically no changes have been made from last season, and the well-tried disk clutch of the Hele-Shaw type and the three-speed gearbox peculiar to these cars, in which the gear changing is effected by dog clutches, still finds favor. The six-cylinder idea does not find a following here, but there is a novelty in the appearance of a landaulette in which the engine is placed beneath the driver's seat, saving a length of over three feet.

As stated before, the show is interesting to a degree for high quality of workmanship and careful design of the various parts, and yet it is difficult to pick out anything departing from accepted practice sufficiently to be worthy of notice. The six-cylinder Belsize of 60 horsepower, the 40-horsepower Simms and a further six-cylinder Horlick are all excellent in their way, but the successful adoption of thermo-syphon water circulation on the Belsize and the system of pedal control on the Simms are the only matters of note.

Humber's Two Fixed Standardized Models.

Humbers have been, perhaps, the most successful of British automobile firms during the past season, and by the adoption of two fixed models and absolute standardization of parts secured no less than $500,000 profit on the past year's work. Hence it is not surprising that the 10-12-horsepower Coventry model is retained for 1907, with its four-cylinder engine and tubular frame. At the other works at Beeston a new model of 30 horsepower will be the object of attention. The engine has four separately cast cylinders and normally runs at only 900 r. p. m.; controlled by variable lift to the inlet valves. Two systems of ignition are fitted and an automatic carbureter which insures economical running. Four speeds forward are provided with direct drive on top speed, and the rear axle is divided horizontally for convenience of inspection. Ball thrust bearings are fitted on the axle sleeves to take up the side thrust on the road wheels. Pressure lubrication is depended on for the engine, and drip feeds supply various moving portions of the transmission gear.

Adams, with Antoinette Eight-cylinder, Shows Novelty.

A recent addition to the ranks of British firms, the Adams Company, of Bedford, formerly made single and double opposed horizontal cylinder engines closely following accepted American practice, and while the single cylinder 8-horsepower model is retained, the double cylinder car has now vertical engine under the bonnet. Transmission is in each case through epicyclic gearing, operated by foot pedals, to rear axle by single chain.

The novelty of the show is to be found on this firm's stand in the eight-cylinder car, fitted with the Antoinette engine, made in England under license. The cylinders, cast separately, have an equal bore and stroke of 105 mm. and are set in two sets of four at an angle of 90 degrees. All valves are operated from one central camshaft. At 1,000 revolutions per minute this engine develops 40 horsepower, and both smoothness of running and flexibility should certainly be highly marked attributes of this engine. The frame is of pressed steel and epicyclic gearing gives three forward speeds and reverse, the use of epicyclic gearing for so high a power being a somewhat unusual practice. The transmission is by cardan shaft to the rear live axle. The gilled tube radiator assumes the form of a letter A and gives the car a very distinctive appearance.

Rolls-Royce, Austin, and Others.

C. S. Rolls & Co. give the place of honor on their stand to the Tourist Trophy and the car that won the race. Six-cylindered models will be pushed in 1907 and several fine limousines were shown on 30-horsepower chassis. Third speed of the four speed gearbox gives direct drive and the rear live axle is of great strength. The driving members transmit the power by outside dogs engaging with the ends of the hubs of the road wheels and are required to support none of the weight.

Mr. Austin, who for years has been responsible for the Wolseley cars, recently set up the Austin Company, which now manufacture high-class cars of sound design. Of 20 and 30-horsepower are the leading models, with chassis prices extending from $2,500 to $4,000. Pressed steel is used in the construction of the frame, the side members of which curve downwards, so as to provide an underframe for engine and gearbox. Four separately cast cylinders are used, with mechanical lubrication by force pump. Gears follow Mercedes practice, with ball bearings throughout. Gate system of speed changing is used, and an interlocking arrangement renders it impossible for the gear lever to be moved until the clutch has been withdrawn. Live axle is used on the smaller model and a choice of chain or shaft drive is offered on the 30-horsepower car, for this purpose the differential being kept separate from the gearbox.

Round about the price of $1,500 to $1,600 there is a fine selection of British cars to select from, all with four-cylinder engines and side-entrance bodies. The Humber and Rover are well known, and now the Singer firm has introduced a 12-14-horsepower car, the main feature of which is that every part is erected as a separate unit and can be dismounted without disturbing other parts.

And so the list goes on, nearly every stand staging the same cars as last year, or, at best, with detail alterations. In the British industry, at any rate, finality in the main points of design is being attained, and the only development to be expected is general standardization and the consequent reduction in price rendered possible.

The foreign cars at Olympia show in some cases more signs of originality, but, nevertheless, in general the tendency seems to be to settle down to a fixed type. Treatment of the points of note on these foreign cars and the novelties in accessories must be deferred until the next issue.

A STATEMENT FROM THE WINTON CO.

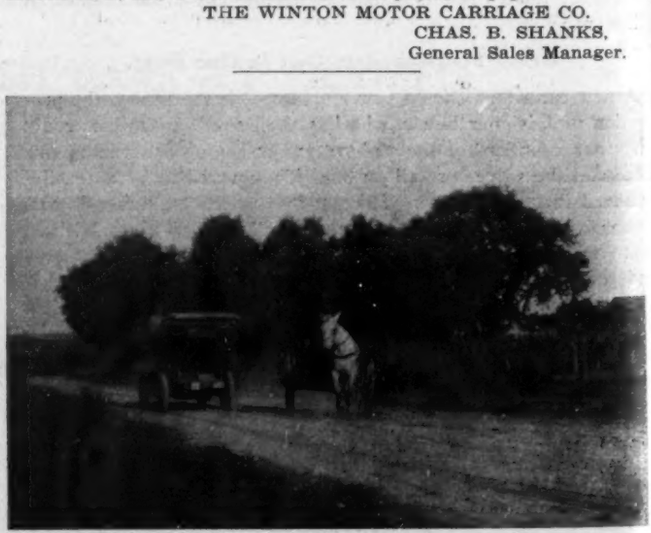
Editor THE AUTOMOBILE:

The Winton Motor Carriage Company refutes the statement, now in circulation, that Leo Melanowski "produced the Winton Bullets that appeared in 1901-02-03." Neither is it true that Mr. Melanowski was employed by Mr. Winton as "chief engineer and designer."

During Mr. Melanowski's term of employment at the Winton factory his work was that of a manufacturing foreman, and at no time did he participate in the production of new designs. He was not even consulted in designing and building the Bullets. Mr. Winton personally supervised the design and construction of all three Bullets. Mr. Winton's assistant, Harold B. Anderson, was next in authority, particularly in the construction of Bullets Nos. 2 and 3.

Mr. Melanowski was released from his connection with the Winton company prior to the production of the Winton Quad, and before Models A, B, and C had so much as been placed on paper.

THE WINTON MOTOR CARRIAGE CO.
CHAS. B. SHANKS,
General Sales Manager.



CONVEYANCES ANCIENT AND MODERN.—A CONTRAST.

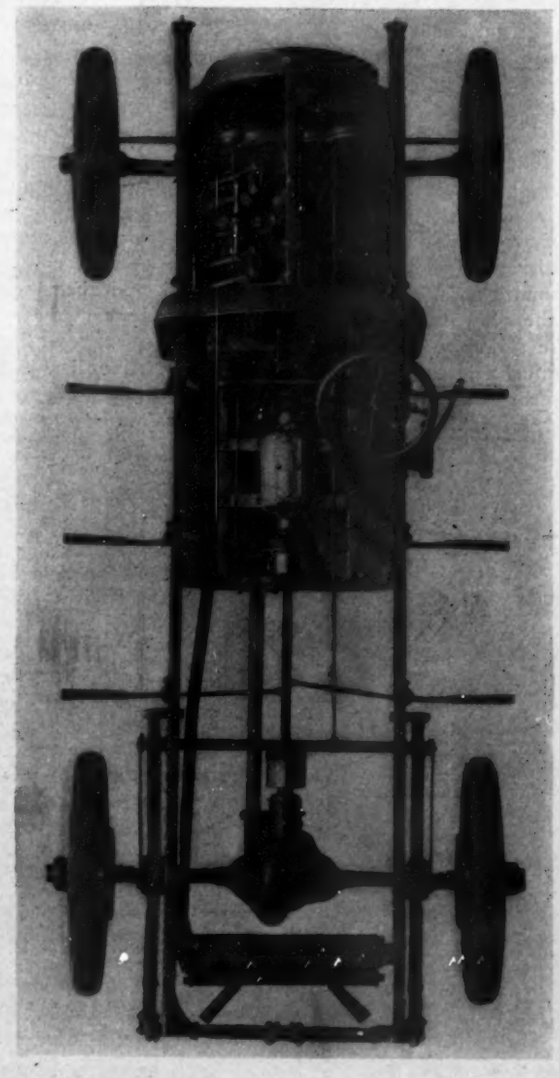
This picture is a graphic summing up of the progress of the automobile as a road vehicle; the horse, in the country and on the roads where he once was the sole motive power for road vehicles, turns out to make room for his supplanter to roll quietly but irresistibly by.

The 1907 Model "C" RAINIER

THE Rainier automobile for 1907, with the official title of Model C, while presenting no radical departures from this year's B, takes on a number of improvements that are in the nature of refinements rather than new departures. This position naturally follows the success of the previous models made by the Rainier Company, of New York City. The line of demarcation between these two is somewhat hard to determine, however, as exemplified in the front springs and their axle seat and clip, where a design has been introduced that does away with the central bolt so universally used and that is generally credited with being the cause of most front spring breakages. In the new design the spring seat on the front axle has a depression and each leaf of the spring has a short longitudinal depression that gives a pocket on the top side of the leaf and a lip on the bottom side. The spring clip has a lip on the under side of its plate. It will be readily seen that when the assembly is made all the leaves are interlocked and that the bottom leaf interlocks on the axle seat and finally that the spring clip interlocks with the top leaf. But one clip is used on each spring and the bolt ends pass through up and down holes in the front axle, the webb of I-beam section being enlarged where these two holes, for each clip, pass through.

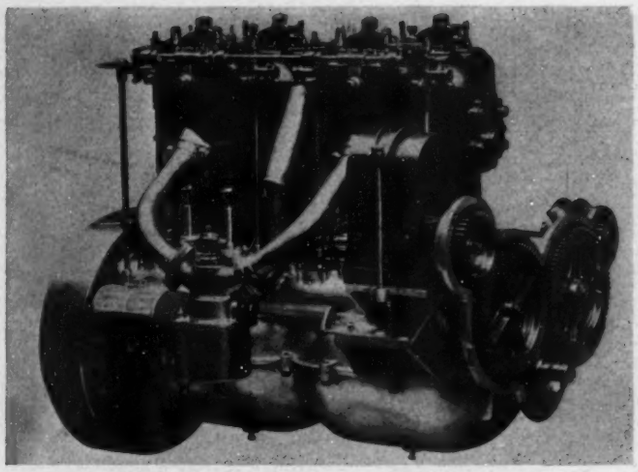
The few other changes noted in the 1907 Rainier are:

The substitution of white brass bearings for the crankshaft and connecting rods in place of bronze as formerly used. The adoption of the wick lubricators on the vertical igniter rod bearings. Simplifying of the spark control. A new mechanical oiler, operated by a steel belt in place of the push rod formerly used. Cork inserts in the leather on the clutch. Platform spring three-point suspension in the rear, replacing the former semi-elliptical. Front springs heavier. Oil cups on all spring hangers. Heavier brakes, both on emergency and propeller shaft. Heavier wheels. Increased comfort and roominess in bodies.

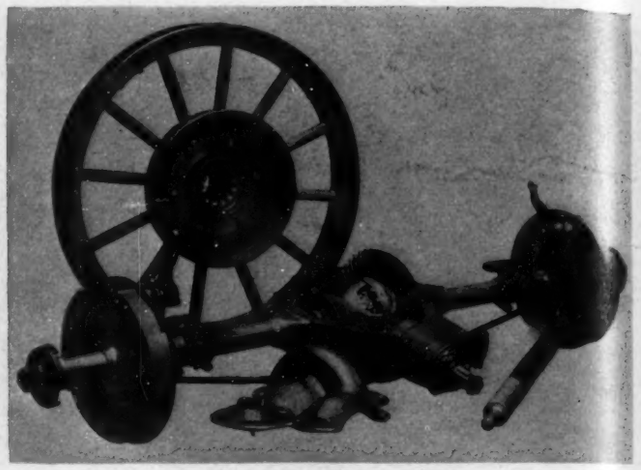


CHASSIS OF THE RAINIER MODEL C.

The four cylinders are cast in pairs with integral water jackets. The rating is given as 35 horsepower with the normal speed, about 1,100 revolutions, but with over 1,800 down to 150 as its range of throttle control. Cylinders, pistons and rings—four to each—are ground. The I-beam connecting rods are of nickel steel, oil hardened and ground in the wrist pin eye. The pins are of hardened and ground tool steel. The crankshaft is cut from a solid block of 50-carbon steel, heat toughened and with generously proportioned bearing areas all through. The advantage claimed for the equality of white brass used in the bearings along the shaft—over the bronze—is that it will not cut the shaft bearings. The bearings in the aluminum crankcase are carried in the upper half of the case, which is carried direct on the chassis frame. The lower half serves as an oil pan. The entire motor can be removed from the chassis by merely disconnecting the systems of piping, inlet, exhaust and water.



MAKE-AND-BREAK IGNITION BY DIRECT DRIVE.

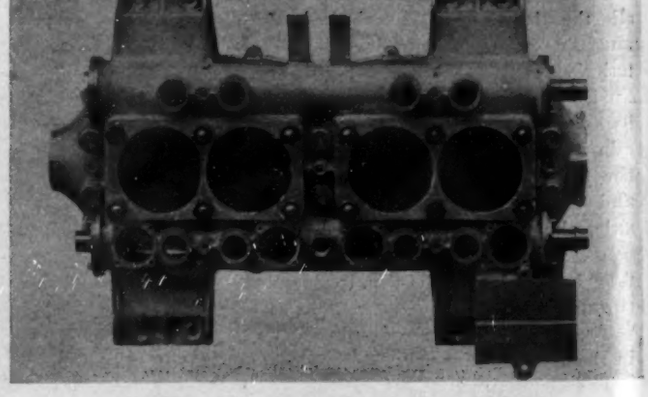


REAR AXLE DETAILS OF CONSTRUCTION.

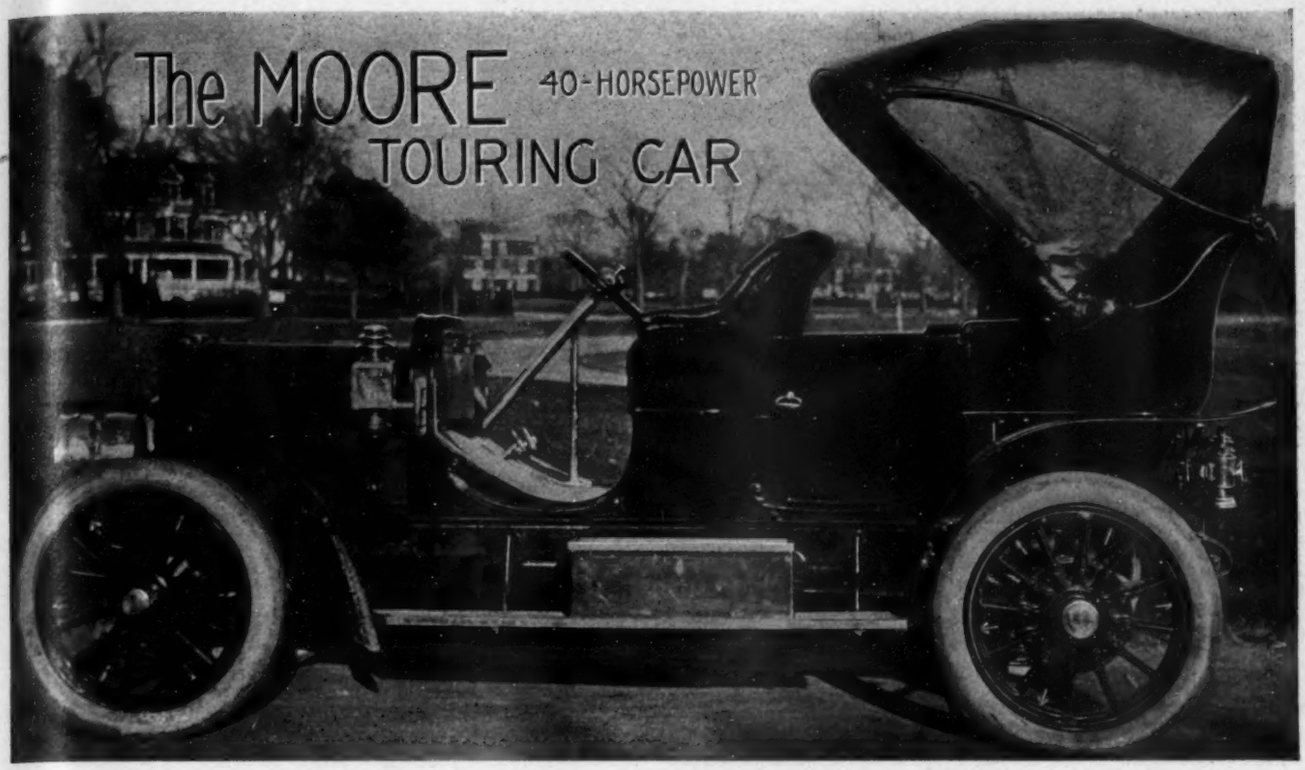
All piping is of polished copper other than the steel tube used for the exhaust. The valves are mechanically operated and are interchangeable. Inlets are on the right and exhausts on the left. The gears of the camshafts are of bronze and fiber, enclosed and running in oil. The cams are of good size, to reduce noise at that point of operation. The centrifugal water pump is gear-driven from the camshaft and is carried on a boss on the engine base. The honeycomb cooler is backed with a ball-bearing fan mounted on the forward cylinder and driven with a leather belt. Ignition is by a low-tension Simms-Bosch magneto carried on the engine base. The Rainier method of contacting differs materially from European practice, where the custom is to operate the contact mechanism by means of a vertical oscillating rod actuated by a cam on the half speed shaft. The objections made to lost timing, due to wear of the cams, is overcome in the Rainier method of operating. Here the igniter is actuated by a vertical revolving shaft, instead of an oscillating rod, and this shaft is positively driven and positively timed by a bevel-gear drive off the camshaft. The hammer and anvil are contained in a block held in its seat in the combustion head by a single nut. The carbureter is of the self-regulating air and float-feed design. The belt-driven mechanical oiler has six feeds and the flow is observable by the mere pressure of a button, and is as readily examined by removal.

The satisfactory leather-faced aluminum cone clutch is retained with the improvement added of using cork inserts in the leather. The thrust yoke works against a ball bearing. The transmission is progressive, with three speeds and reverse, direct on high. The propeller shaft has a sliding connection at the rear and is paralleled by a tubular torsion rod extending from the rear axle to a spring buffer on the crossframe. The rear axle is of the divided, floating type which takes the weight strains away from the drive proper. The contracting brake on the propeller shaft and the expanding emergency brakes in the rear hubs act independently of each other. Ball bearings are used on all four road wheels, which are shod with 34 x 4-inch tires. In addition to the construction previously noted, of the front springs, the 1907 Rainier rear spring outfit is changed. It is now of the rear platform or "three-point suspension" method of frame hanging. Although the car is designed to seat seven, the wheelbase has been kept down, by designing, to 104 inches. The spark and throttle control levers are placed above the steering wheel and their sector does not move with the wheel. Foot pedals are in the usual position and push forward. The equipment of the car includes two acetylene headlights and generator, two oil side lamps, oil tail lamp, horn, jack, tire outfit, tools and a supply of spare parts. All bodies are ironed for tops before going to the trimmers.

TRANSMISSION AND TRANSMISSION CASE IN DETAIL.

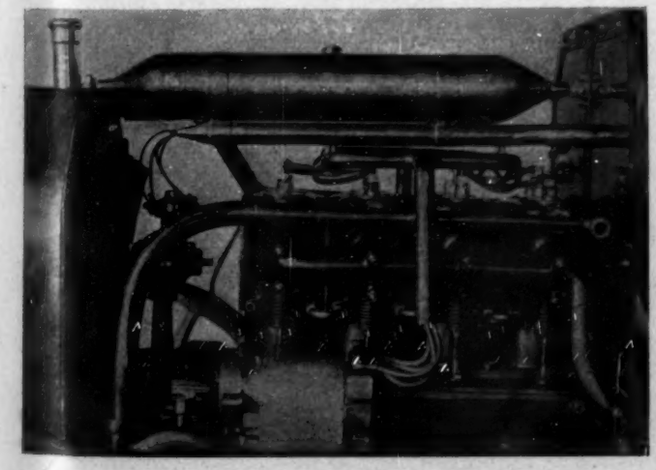


CRANKSHAFT AND TOP VIEW OF CRANKCASE.

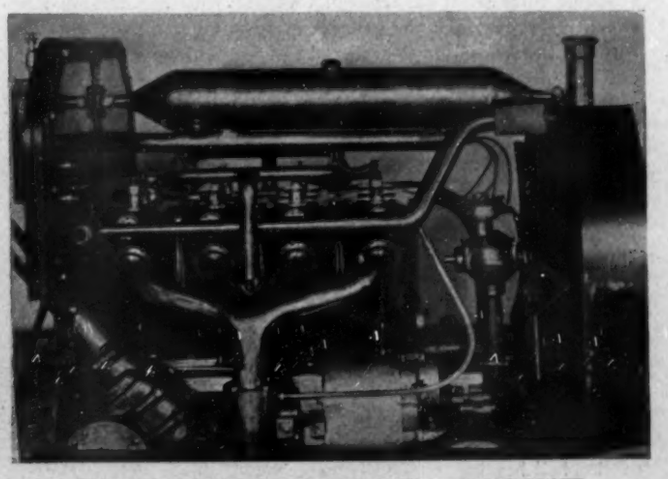


THE very essence of ball-bearing automobile construction marks the car made by the Moore Automobile Company, of New York City, inasmuch that every rotating shaft, except the bearings at the big end of the connecting rods, runs on single-track ball bearings. This designing ought to, and it is claimed that it does, reduce the need of continuous oiling. In conjunction with this general use of ball bearings, balance in construction is held by the free use of chrome nickel steel and original design, with purpose, in many details. The car is also notable from the fact that, although with four forward speeds, the direct drive is on third.

The cylinders are four in number of 4 1-2 bore by 5 1-2-inch stroke. They are cast separately with valve bearings on opposite sides, carrying semi-integral water jackets, large screwed-on plates being used at the front and back side of each water jacket. A large inspection plate is inserted in the top of the combustion chamber, cylinder head, for the ready removal of deposits in the piston head without dismantling the engine. The four ringed pistons are mounted on hollow pins, ground to size, that have a spherical bearing on the upper half of the crank pin brass, enabling it to adjust itself should there be slight misalignment and ensuring a uniform bearing for the entire length. At the big end of the connecting rod the lower cap extends only about one-half the length of the crankpin, allowing the exposed parts to dip into the oil. The lower cap also has two scoops taking oil at each down stroke and forcing it to the unexposed portion of the crankpin. The crankshaft has five ball bearings, three between the cylinders and two end bearings, and is built up of four U-shaped cranks and two end stubs. The U-shaped cranks are all alike in construction, turned from the solid and bolted together with male and female members provided with spacing collars for carrying the ball raceways. The crankcase is of manganese bronze with the bottom cover of aluminum. The camshafts are driven by a cross-shaft on the front of the engine by means of spiral gears, of course, all on ball bearings, inclosed by suitable covers which form a part of the main crankcase. All valves are interchangeable and removable through screwed plug caps in the tops of the valve



EXHAUST SIDE OF MOTOR AND ONE MAGNETO.



INTAKE SIDE COMBINED COMMUTATOR AND FAN SHAFT.

GENERAL VIEW OF THE MOORE CHASSIS FROM THE RIGHT SIDE SHOWING GENERAL DETAILS.

housings. All parts of the engine are oiled by splash from the crankcase, the supply being in a torpedo-shaped tank over the engine-head, feeding by gravity through a sight-feed on the dash.

The flywheel is cast steel with fan blades and contains a metal-to-metal clutch in its hub and running in oil. It is made up of a double cone disk of chrome steel and an expanding steel ring set out against the inner side of the clutch cone by a cam which in turn expands the clutch disk against a chrome steel housing keyed into the flywheel hub. The clutch fork, operated by the foot-pedal, has two ball bearings with conical contact on the clutch cover. The clutch spring is inclosed in an oil case. An inclosed double universal and sliding joint is inclosed and placed between the engine and the gearcase. The sliding gear-drive is of the selective type, with four forward speeds and a reverse, with the direct drive on *third* speed. One interlock prevents the change lever operating until the cone is withdrawn, and another holds any gear combination against slippage.

The motor is carried on a sub-frame supported by the main frame at three points, the two at the rear of the sub-frame being attached to circular bearings and the third point swinging in a link and double pin support at the front cross-frame member. The transmission case is suspended at its back end from the main frame by two trunions and at its front end by a bracket on the tubular cross member of the main frame which carries the engine by the swinging link and double pin support. This gives a double three-point suspension, together with the universal between the engine and the gearcase, and another double universal between the transmission case and the rear axle gives a wide latitude for distortion in the drive due to road surfaces. The propeller shaft is made up, in one piece, of a solid shaft surrounded by a tubular shaft. These are jaw connected to the through drive with a limited play in the jaws of the external section. The result is that the inner, solid, portion of the shaft takes the immediate transmission of power, and the outer, hollow, shaft portion any overshock strain of transmission. The differential, of the spur-gear type, drives a divided, floating type rear axle. The main axle proper, carrying the car weight, is a hollow sleeve of manganese bronze in the form of a double cone joining the spherical case. Extending into this axle and supported near the spherical case and at each end are two hollow tubes of chrome nickel steel supporting the frame and springs at their outer ends, the extreme ends forming the wheel axles.

The cooler is of zigzag cellular construction. The pump, one of the ball-bearing outfits, is centrifugal, direct driven, by the cross-shaft driving the camshafts. Water piping is all graduated in proportion to flow and pressure. The ball-bearing fan is gear driven. The carbureter has a float feed and is claimed to be self-compensating without the use of auxiliary valves, springs, or diaphragms. A triple system of ignition is used, two from high tension magnetos and one from battery and coil. The commutator for the latter is placed on top the fan column. The advance of the spark when running on either magneto is controlled by a governor. A switch on the steering column controls each ignition separately or in conjunction if desired.

The frame is supported on semi-elliptic front and full elliptic rear springs. The wheels—ball bearing—are equipped with 920 mm. by 120 mm. tires. The dash is formed integrally with the main frame, to which is attached the steering post. The steering wheel can be tilted in either direction without interfering with the control levers or current switch. The wheelbase is 116 inches; standard tread. The front axle is of I-beam section, and the steering knuckles have double ball bearings. The starting handle has a special device to prevent kicking in case of backfiring. The motor is controlled by levers above the steering wheel, which are independent of the latter's turning. The clutch pedal, on the left, is interconnected with the throttle lever. The right hand pedal controls the clutch as well as both the transmission and emergency brakes. At a given point, spring controlled, the strain on the transmission brake ceases with the further depression setting up the strain on the emergency hub brakes. Both brakes are double acting, the emergency expanding. The transmission brake runs in an oil bath water cooled. An automatic sprag, with pawl and ratchet, is cut in the side of the transmission brake drum. Two tool boxes make up part of the regular construction, one on each running-board. The body is pivoted to the rear cross-frame member, and can be elevated at the front for examination of the entire mechanism. The bonnet and mudguards lift with the body, the whole being held down by screws attaching at the side frame members. The car as a whole has a very solid, substantial appearance.

HOW THE CRANKSHAFT IS BUILT UP FROM SECTIONS

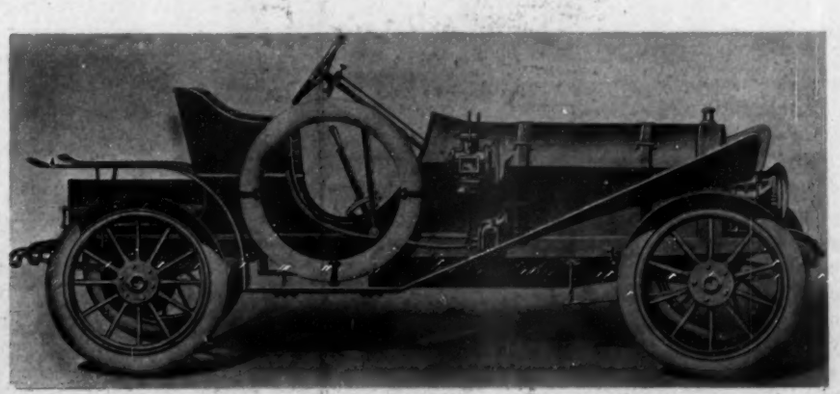
MODEL A OLDSMOBILE, 35-40-HORSEPOWER PALACE TOURING CAR.

GIVEN a chassis of practical design, it to-day serves the general requirements of the trade when it is equipped with a choice of the three styles of bodies: touring cars, runabouts and limousines. Under these conditions automobile construction at least approaches enduring design. This condition represents the standard for 1907 pleasure cars as made by the Olds Motor Works, of Lansing, Mich., in its Model A. Three body designs furnishing the distinguishing names of the Flying Roadster, the Palace Touring Car and the Model A Limousine. Each is virtually the same in general construction, the differences being in the obvious details surrounding the body conditions. Following closely the lines of this year's car, the lessons taught by the Glidden and other tours have been mastered for the benefit of details, in which may be mentioned springs and motor as perhaps the chiefest, but not the only, refinements.

The four-cylinder vertical motor is rated at 35-40 horsepower at approximately 65 pounds compression with a bore of 4 1-2 inches and a stroke of 4 3-4 inches. The valve housings are all on one side, with interchangeable valves and springs. The valve heads are cast iron threaded and brazed to machine steel stems. An index pointer extends from the crankcase over the flywheel for valve timing, as well as for the dead centers and the ignition points. The pistons are tapered to reduce friction and have three rings above and two oil grooves below the piston pin. The piston pin is a hollow steel tube pressed in and held by pointed set screws. The connecting rods are I section. The piston end is fitted with a hardened and ground-steel bushing with an oil splash slot passing through both at top.

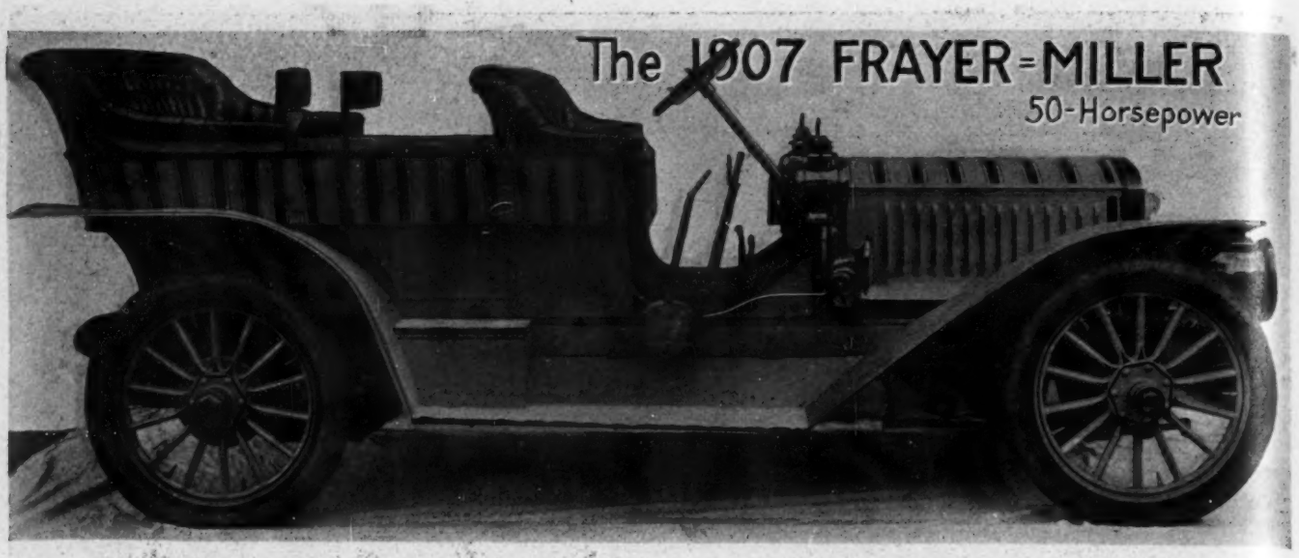
The aluminum crankcase carries the three crankshaft bearings in the upper section, the lower section acting as an oil pan. The bearings are Parson's white metal of good length, the front being three and one-half inches, the middle two and seven-eighths inches, and the rear five inches. In connection with the crank attention is drawn to the system of lubrication, wherein no piping is used whatever. Lubrication of the main bearings is by means of an oil pump driven by the camshaft and a passage through the crankcase for the constant stream of oil. As soon as the oil passes the main bearings it drops into the crankcase and from there into an oil reservoir, which is a lower extension of the crankcase oil pan. In order to maintain a constant level for the splash system used in lubricating the connecting rods and pistons, small holes are drilled in the lower portion of the oil pan so that the oil can only stay at the required depth, the excess draining into the reservoir. A glass at the front end of the reservoir shows at all times the amount of oil present.

The clutch is of aluminum covered with leather and withdrawing backwardly when released. In addition to the seating spring there is an extra spring back of the cone slide to prevent jerking in starting, giving a spring take-up for the load. The transmission is of the selective gear design with three forward and a reverse. Final drive is by propeller shaft and Timken roller-bearing rear axle with outer bearings in the end of the axle tube. The front axle is made of steel tubing. Thirty-four-inch wheels are used all round with 3 1-2-inch front and 4-inch rear tires. Three brakes are equipped, one on the transmission shaft and the other two in the rear wheels, the latter expanding and the former contracting on a drum just back of the transmission case. The brake shoes are provided with either camel's hair or metal faces, according to the section of the country in which they are to be used. The car equipment consists of a full set of five lamps, a horn and luggage carrier at rear. The wheelbase is 106 inches and the seating capacity five persons. The tread is 55 inches. The body is of wood with side doors at the *front* seats as well as at the rear. The touring car sells for $2,750 and the limousine at $3800.

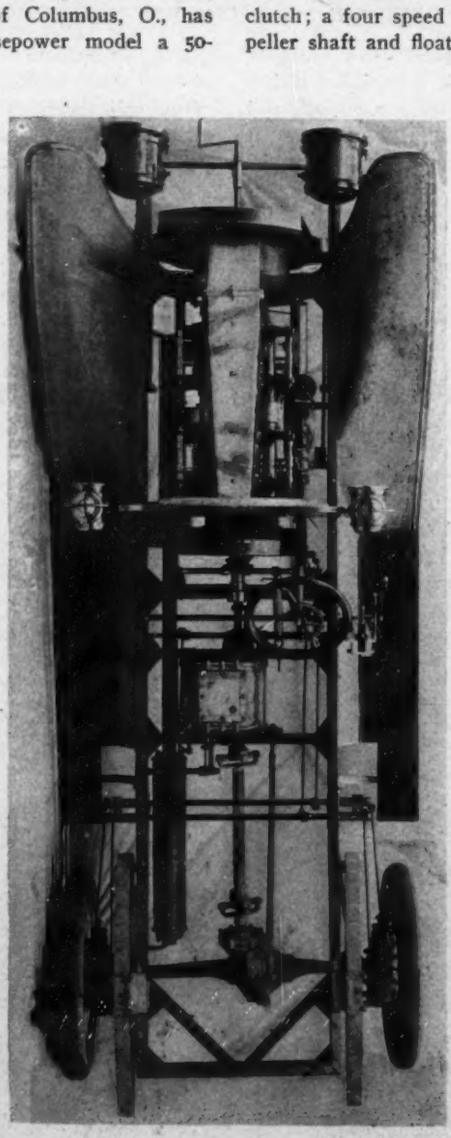


OLDSMOBILE FLYING ROADSTER WITH 35-40-H.P. MOTOR.

The 1907 FRAYER-MILLER 50-Horsepower



DEMONSTRATING its claim in the Vanderbilt racers that by its system of air cooling practical cylinders of any size could be cooled by the method used on the Frayer-Miller cars, the Oscar Lear Automobile Company, of Columbus, O., has added to its already well-known 24-horsepower model a 50-horsepower automobile for seven passengers. The engine details in the new model will be at once recognized as similar to those used on the Vanderbilt Cup cars, the only real difference being in the size. The new engine has 5 1-2-inch bore and a stroke of 5 1-8 inches. Carrying out the originality in design that has always marked this car the change from the 24-horsepower model that is most striking is the use of a single camshaft with adjustable push-rods controlling the lift of the valves. In the cylinder heads the valves continue to be placed at right angle and opposed, with the intake on the right and the exhaust on the left. This means that the push-rods, the camshaft also being on the left, for the exhausts are vertical, while those for the intake are diagonal, running, in two pairs, between the first and second and the third and fourth cylinders, the cylinders being separately cast. The regular Frayer-Miller distinctive aluminum air jackets are retained around the upper portion of the cylinders with their oblong-shaped stand pipes reaching up to the air duct. This air duct crosses the heads, bends down and forward and emits with the casing around the blower fan, which is geared from the crankshaft. This blower forces the air down over the cylinders and out of the open bottoms of the air jackets. The carbureter is of the self-regulating float-feed design and feeds through a quarter turn elbow to a straight line manifold placed just below the intake valves. Jump-spark ignition is used with the commutator on the front end of the camshaft. The rear end of the camshaft carries the pulley for a flexible belt driving the force-feed oiler, with sights, on the back side of the dash. The drive is through an internal-expanding clutch; a four speed and reverse sliding-gear transmission; propeller shaft and floating type rear axle.



CHASSIS OF FRAYER-MILLER SEEN FROM ABOVE

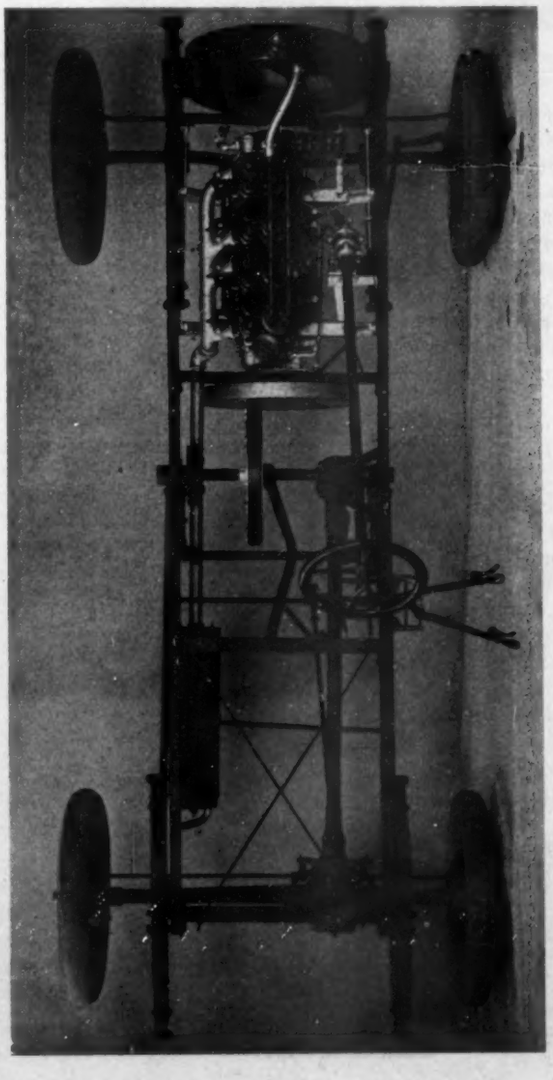
The new model has a wheelbase of 122 inches, with 36-inch wheels and 4 1-2-inch tires all round. Rear springs are full elliptic, forty inches long and two and one-half inches wide, with scrolls at the ends of the upper sections. The front springs are semi-elliptic with seven leaves, placed eighteen inches in front of the axle and twenty inches from the center of the clip to the rear of the spring, with a width of two inches. The front axle is tubular with a change in the design of the steering knuckle. Both axles have annular ball bearings, these bearings being used pretty generally throughout the construction. The rear of the frame is raised over the rear axle so that the center of gravity is low and yet a clearance of twelve inches is maintained.

The seating capacity is for seven passengers, the two forward seats in the tonneau revolving, allowing the occupants to sit facing forward or to turn and face the passengers on the rear seat. The fenders are of the closed-in design, as used on this year's 24-horsepower car, so that no mud reaches the passengers or the body of the car. The price of the new model has been fixed at $4,000, with complete equipment of lamps, generator, horn and tools. The weight is given as 2,750 pounds.

In addition to the new model, the 24-horsepower touring cars and runabouts will be continued and there will be added a 5,000-pound truck using the distinctive Frayer-Miller air-cooled system, giving a complete line. This truck takes on the general construction of the 24-h. p. touring car chasis.

KEEPING everlastingly at it and persistently advocating the practicability of the friction-driving system which is the central feature of its cars, the Buckeye Manufacturing Company, of Anderson, Ind., builder of the friction-driven Lambert gasoline automobiles, has brought its machines to a state of development where they ask no odds from gear-driven machines. The accompanying illustrations show the latest model of this machine, the 1907 Model H. The features of the car are no longer new to the automobile public, and a short description will suffice to give the leading points of the new model.

Motive power is developed by a four-cylinder water-cooled Rutenber motor with cylinders of 4 1-2-inch bore and 5-inch stroke, rated at 35-40 horsepower, placed in the usual forward position and attached to the framing by a three-point suspension system. Lubrication is supplied by a mechanical oiler, gear driven, the feeds being fitted with sight glasses; ignition is by jump spark with storage batteries as sources of current. The carbureter is of the float-feed type and the control of spark and throttle is effected in the usual way. There is no clutch, in the usual understanding of the word; the flywheel is of greater diameter than usual, and its rearward face is perfectly flat and covered with a special friction composition. Against the face of the flywheel is pressed the edge of a friction wheel whose axis is at right angles to that of the crankshaft; the friction wheel is movable along the cross-shaft it drives, and it is by this movement that changes of speed are obtained, for it is obvious that the nearer the friction wheel is to the circumference of the flywheel, the faster it will rotate, and *vice versa*. Crossing the center of the flywheel, the friction wheel will rotate in the opposite direction. By means of a pedal the friction wheel is withdrawn from the face of the flywheel while changes of speed are being effected by the side lever, the process being practically identical with shifting gears in a gear-driven car. The graduations are very close together, and the number of speeds obtainable so great that the best speed for existing conditions is easily determined.



NEW LAMBERT MODEL H WITH SHAFT DRIVE.

Final drive is by propeller shaft, the shaft being gear-driven from the cross-shaft on which the friction wheel is mounted. Owing to the space necessary for the transverse movement of the friction wheel on its shaft the forward bevel gearing in its casing is placed to the right of the center and the propeller shaft extends to the usual bevel driving gear on the live rear axle.

The car, generally speaking, is of the light touring type, with side-entrance body, seating five persons and weighing, complete, 2,000 pounds—a light car for its power. The wheelbase is 105 inches and the tread the standard 56 inches; the artillery wheels are 32 inches in diameter, shod with 3 1-2-inch tires, of the same size front and rear. Framing is compound, of angle steel and wood. Front springs are semi-elliptic and rear springs full elliptic. The steering gear is of the screw and nut type and brakes are carried on the cross-shaft and in the rear hubs.

CHEZ FOURNIER, AT HIS PARIS GARAGE

By W. F. BRADLEY.

PARIS, Nov. 22.—"Chez Fournier," or at Fournier's Garage, does not sound so pompous as Société Paris-Automobile, 48-50 Rue d'Anjou, Paris, yet everybody employs the shorter term, and everybody knows that Fournier is the manager of a garage unsurpassed for size, completeness, elegance and careful management. It is no wonder that Fournier's has become the recognized rendezvous of American millionaires visiting Paris—all Americans who visit Paris are millionaires—and that famed European knights of the wheel are always to be found within its walls. Drop in at 9 o'clock any morning during the touring season and you are certain to be ogled by a majestic English lord, to rub shoulders with a continental prince or duke, to hear the loud talk of a Chicago beef-packer, and to recognize some member of the A. A. A. or some well-known American automobile manufacturer. Certain Parisian automobile agents boast that you can never enter their store without meeting a member of Europe's huge royal family. Fournier's pride might be that you can always encounter the world's best known automobilists at Rue d'Anjou; for although crowned heads may be enticed into salonlike salesrooms, it is the man with the automobile spirit in him who enters the noisy garage.

PAL INTERIOR OF THE MAMMOTH GARAGE—NOTE THE THREE GALLERIES.

M. FOURNIER, RAINIER, AND DOG.

Paris-Automobile garage consists of a one-story block facing the street, the central entrance dividing the showroom into two parts, that on the left showing some half dozen finished cars and the right being reserved for automobile fittings and accessories. At the end of the short track leading into the garage is on one side the caretaker's cabin and on the other a telephone box. Day and night a guardian is on duty and not a car enters or leaves the garage without its number being snapped up and recorded in the log book, together with the hour. If a chauffeur passes the box and backs in again a moment later to pick up some forgotten article the fact is recorded against him. At night time and in cold weather the big iron and glass doors are opened mechanically and closed by the guardian without leaving his box on the first toot of a horn or on the ringing of the bell. During the height of the season frequently as many as 250 cars are stored in the garage, and this immense squadron can be accommodated without hampering the movements of arrivals and starters.

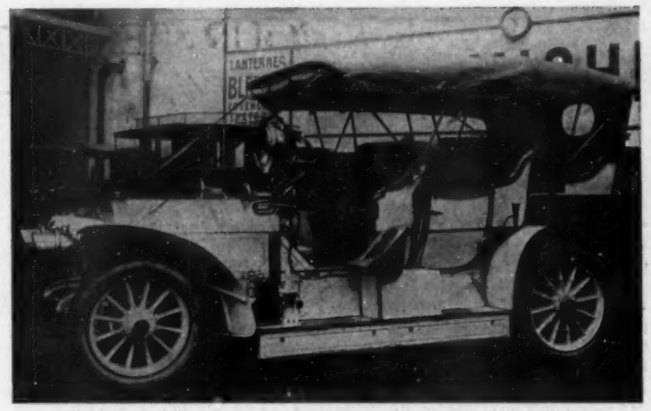
As the accompanying photograph shows, the garage area consists of a big floor space and three superimposed galleries built on steel girders and reached by a hydraulic lift large enough to carry the biggest touring machine. Under the galleries are the washing quarters, well lighted and liberally supplied with water, while around all the walls, on both ground floor and galleries, are hundreds of lockers for the use of mechanics.

The elevator descends into the basement, where a complete repair shop is installed. In one corner of the ground floor is a Mors apparatus for charging storage batteries. As an indication of the careful management of the garage, it is interesting to note that at various places around the walls are electric cigar lighters, which it is requested all should use instead of matches, in order to lessen the risk of fire. Chemical extinguishers hung round the walls and buckets of sand at regular intervals are in readiness in case any outburst should occur. Special care is taken to keep the gasoline safe. All the gasoline is received in five- or ten-liter sealed metal tins and stored in a small iron and glass shed lined inside with strong wire netting and placed in one corner of the ground floor close to the main storeroom. During the busy season the supply is renewed from the oil refiner's factory twice a day; thus there is always a sufficiency, but never a dangerously large stock. In the basement are huge stocks of tires of various makes and every size, while up above on the ground and first floor are big quantities of every spare part or accessory that the autoist requires.

ANOTHER VIEW WHICH ILLUSTRATES THE VASTNESS OF THE CAPACIOUS BUILDING

Behind the showroom, and entered from the garage, are various offices, manager's room, telephone cabin, waiting-room, lavatory, etc. Above these has just been constructed another set of rooms, consisting of counting-house, directors' room, a fencing-room with a bathroom leading from it, and the usual cloakrooms and lavatories. This recent addition will certainly be appreciated by visitors, for the garage is now a place where an hour or two can be passed agreeably and where rendezvous can be made with friends, who, like yourself, are of the automobile trend.

Henry Fournier, the manager of Paris-Automobile, is a familiar figure in other than French automobile circles. Some years have passed since he first brought himself prominently before the public as a cyclist, and in these rapidly moving times his trip to America in 1896, where he introduced the first motorcycle and earned for himself much popularity, seems almost ancient history. Henry Fournier rode to victory with Charron in the first Gordon Bennett race, won the Paris-Bordeaux race on a Mors machine and then Paris-Berlin in 1901. His racing days are over now, though Fournier is still capable and has many a time been strongly urged to sit behind the steering wheel of a racer. Business, however, holds him, and for his ordinary affairs Henry Fournier is driven about town in a comfortable Panhard limousine. When he is on a pleasure jaunt, however, he brings out a smart, bright red two-seater Rainier runabout, his favorite bulldog has the spare seat, and away they go—a happy trio.



PONDEROUS ITALA CAR OF QUEEN MARGHERITA OF ITALY.

There are many garages in Paris, but in most instances they are located along the Avenue de la Grand Armée, which is the automobile row of the French capital. Fournier has found Rue d'Anjou a better location, for it is more in the heart of the city and convenient to the hotels and leading places of amusement. It would be similar to a middle Broadway location in New York City.

BRITISH CLUB'S NEW PLAN OF HORSEPOWER RATING

LONDON, Nov. 20.—There appears to be a general desire that the A. C. G. B. I. should officially issue a simple formula which shall serve as a rating for internal combustion engines such as those in common use on self-propelled vehicles, that is to say, engines of the ordinary single-piston four-cycle type using petroleum spirit as fuel. This rating is required so that the public may arrive at the approximate power of any given engine in comparison with others.

There is, obviously, only one accurate way of determining the effective horsepower of any particular engine, and that is to try it on the brake. For the purpose, however, of a general rating formula, an approximation will suffice; indeed, it is the only thing possible, owing to the many variable factors, which affect the power developed by any engine.

In a formula for rating purposes it is desirable to eliminate, as far as possible, the various factors which effect the horsepower. Horsepower is a matter of foot pounds per unit of time, and resolves itself, in an automobile engine, into pressure on and the linear velocity of the piston. The linear velocity of the piston is the product of the stroke and the number of revolutions. It being assumed that all makers aim at supplying the most effective mixture from their carbureters, the maximum pressure on the piston depends on the ratio of the compression space to the volume swept by the piston. This ratio varies but little in most types of modern automobile engines. The high limit of compression is reached when preignition of the charge occurs, and the low limit need not be considered, but, as a matter of fact, most designers aim at about the same degree of compression, and, if this be admitted to be the case, then this factor may be eliminated from the formula.

The maximum linear velocity which can be prudently and economically employed is fairly well established at the present time, and it can safely be said that the best constructors are working approximately to the same figures. For the purpose of the "A. C. Rating Formula" the linear velocity of the piston is taken as a constant and the formula correspondingly simplified.

There remains, therefore, as a basis for the Rating Formula, the area of the piston only, and this is proportional to the square of its diameter (D^2); so the formula resolves itself into $\frac{D^2 \times N}{X}$ where N is the number of cylinders, D the diameter of the piston in inches, and X a constant.

The numerical value of this constant depends solely upon the allowance which it is determined to make for the variable factors already referred to. If this allowance be small (so that the result obtained shall approximate to the maximum horsepower obtainable from any given engine), 2 would not be too small a figure. If 2 be taken, then the horsepower of a four-cylinder engine of 4-inch bore, would be rated at 32, which is approximately the horsepower which could be obtained as a maximum from such an engine. If 3 be taken, then 21 1-3 horsepower is obtained, which is a low figure for the result which such an engine would give on the brake. A constant giving a result midway between the maximum and minimum limits which may be expected from engines of the lightest or commonest designs respectively has therefore been adopted, and 2.5 will be found reasonable and sufficiently accurate for all comparative purposes.

The club has therefore decided to adopt as the "A. C. Rating Formula" $\frac{D^2 \times N}{2.5}$ or 2-5 of D^2. N.

This formula is for a "rating" only, and is not to be considered as an accurate or scientific calculation of actual horsepower.

The Council of the Society of Motor Manufacturers and Traders has recommended to the members of the society the adoption of the formula for their catalogs.

Speed Course Now Under Construction.

The announcement of the proposal to construct a track for automobile racing on Long Island is of great interest, but such track will not be the first of its kind. Already work is in active progress on the construction of a four-mile circular track at Weybridge, about twenty-two miles from London. The width of the track will be over 100 feet, and the banking on curves will be sufficient to permit of very high speeds. A shorter track within the circle is proposed for straightaway records. The enterprise is being run on commercial lines and an attempt will be made to popularize motor racing into the same sphere as horse racing now holds. Both the Automobile Club and manufacturers regard the idea with great approval, and have promised their enthusiastic support when the course is ready to use.

SIX-CYLINDER ADVOCATES COME FORWARD

F. P. ILLSLEY'S STEVENS-DURYEA EXPERIENCE.

To the Editor of THE AUTOMOBILE:

I have operated a six-cylinder Stevens-Duryea touring car more than 5,000 miles this year, and do not have to depend upon hearsay as to what a six-cylinder car will do or will not do. For five years I have been fairly well posted on four-cylinder cars. My order for 1907 calls for seven "sixes" to each "four."

It is true that a large number of makers in Europe have been at work on six-cylinder cars; the fact that one only has succeeded in producing a successful machine, and the others have not, is evidence—not that it cannot be done, but that these others don't know how and will have to keep on trying until they learn. I would submit a pertinent question, and that is: If the four-cylinder car so completely meets the requirements of the users, why are the oldest and biggest firms in Europe working so tenaciously on six-cylinder cars—firms like the Mercedes, Panhard, Napier, Clement, Hotchkiss—and why are such famous engineers as Thornycroft making a six-cylinder car; likewise the Humber Company, Rolls-Royce, Gladiator, Argyll, and a number of other lesser lights?

The Napier company build the finest four-cylinder cars made in England, and for two years after its six-cylinder car came out it made both kinds; to-day its six-cylinder business has become so large that it has dropped the four entirely. If after three years' experience with the six-cylinder car this company decides that it is so good that it is making a safe move in burning a bridge or two behind by quitting the fours, its opinion should carry more weight than those expressed by Mr. Waldon, whose company has yet to build its first car of this type.

Other people besides automobile-makers are believers in six-cylinder engines. A number of the big railroads are experimenting with gasoline-propelled coaches. Is it not significant that nearly every one of these cars (according to reports which have been given me) is equipped with a six-cylinder engine, despite the fact that these engines—owing to their size—had to be made to order, whereas four-cylinder engines could have been had in several months less time and for much less money. The General Electric Company at Schenectady is at it also. It had a special six-cylinder engine made in England and imported it to this country.

It is true, as Mr. Waldon says, that most of the European makers who have tried six-cylinder cars have not succeeded, but it is also true that they have not given up trying.

The automobile business is a young industry. When the "Times-Herald" race was run in Chicago in November, 1895, there was not a producing automobile factory in the country except the Duryea. The Duryea gasoline car which won this race was built by the same designer who is producing the Stevens-Duryea. In 1899 there was not one of the present Chicago automobile agents in this business except myself; in 1901 there was not an automobile store on Michigan avenue; in 1903 there was not a single make of four-cylinder cars being produced in quantities in this country.

There is a practical reason for the fact that the six-cylinder Stevens-Duryea is a success, and that fact is, that the man who designed it knows his business. Mr. Duryea built his first gasoline car in 1891, only a year after the Panhard company built its first car in France, and more of Mr. Duryea's ideas have been copied by others than of any other living designer. Easily 50,000 automobiles of the 100,000 now in use in this country are designed upon the lines of the car used by him in the "Times-Herald" race.

If the Stevens-Duryea company had not tried the sixes out thoroughly and was not most absolutely convinced that the six-cylinder is better, it certainly would not have ordered material to make $4,000,000 worth of six-cylinder cars, a greater production than has ever before been attempted by any maker in the world, and if the six-cylinder Stevens-Duryea failed to "make good," or developed any defects in design or construction, what do you think would become of the makers who had ordered material for such a tremendous quantity? Do you think any sane manufacturer would run any such risk on an "experiment" or "fad"?

When we take a prospective purchaser out for a ride in a six-cylinder car we show him a performance which he instantly realizes to be without question something that he never before has seen in an automobile. The only question in his mind is whether the car will continue to do the same work, or whether there is some hidden defect which he has not been able to see.

When it comes to this part of the argument I can give him concise and specific information, based not on what the factory tells me, nor on what troubles European makers may be having or not having, but on what I have seen after 5,500 miles of driving one of these cars myself, driving over all sorts of roads, over all sorts of hills, and doing everything that a man should want to do with a car.

Chicago, Ill F. P. ILLSLEY.

HENRY FORD SAYS THAT BARKIS IS WILLIN'.

To the Editor of THE AUTOMOBILE:

I have just returned from a long shooting trip in the upper Michigan peninsula, and so have only recently read Mr. Waldon's attack on the six-cylinder car, which the Packard sales manager after a trip to Europe characterizes as a "fad." Mr. Waldon has a right to his opinion, of course, and if the six-cylinder car is a fad, why, of course, it is a fad—in his opinion. Besides, we must be charitable and remember that he has no sixes to sell.

There is, however, one statement in that article that is ambiguous and therefore misleading. (Not intentionally so, I am sure, for Mr. Waldon is a gentleman of the old school as he is a salesman of the new.) Most readers would understand his reference to "a widely heralded English six-cylinder car" to mean the Napier, and reading further, would be led to the erroneous impression that the Napier Company builds more four-cylinder cars than sixes. Mr. Waldon must know what all the world knows, that Napier believes in and builds nothing but sixes nowadays. It was the Rolls-Royce factory which Mr. Waldon visited in his eagerness to learn something about six-cylinder cars. (By the way, why this keen interest in this type of car?) And it was the Rolls-Royce car which "had been so widely heralded" because of its decisive victory over the representative European four-cylinder car—the Martini—in a series of tests specially designed to silence the clamor for sixes. That the victorious Rolls-Royce was the only six-cylinder car that concern had made, speaks well for the six-cylinder idea, for every visitor to the French salon remembers the splendid Martini—a finished representative of the four-cylinder class if there ever was one.

Doubtless it is true the Rolls-Royce Company had not yet built great quantities of sixes. The reason may be the same that impels other makers to disparage that type—they cannot change models without scrapping an immense amount of material long since purchased for four-cylinder cars. That prominent concerns feel it necessary to disparage the six-cylinder car signifies that it is not a fad, but has become a serious proposition to those who do not make that type of car. One does not have to remember very far back to recall similar statements to the effect that four-cylinder cars were only a fad—the single cylinder car being exploited as the very acme of simplicity. Oh, that splendid fallacy! that idea that complications and troubles increase with the increase of cylinders—a conclusion that can only be arrived at by ignoring all experience; for experience proves that whether or not the designer's difficulties are thereby increased, the troubles of the driver are in inverse ratio to the number of cylinders in his motor.

As in every other mechanical device there is a maximum efficiency limit—a point at which we obtain the best results—beyond which we gain little—before which we have imperfection. In a four-cycle gas engine we reach this in six-cylinders with cranks set at 120 degrees. I do not give this as my opinion—it is a mechanical fact known to all engineers and admitted, I think, by all save those whose bread and butter lays on the side of fours for the present. For the above reasons it is idle to talk of eight or more cylinders—six gives most nearly perfect results in balance, lack of vibration, constant power, flexibility, and longevity.

In every test between sixes and fours, sixes have won. Pity it is that no test which can be carried out in a few days or months can demonstrate the superiority of the six in that essential quality in which that type of car most excels—long life. Vibration is the "white plague" of the motor car; its ravages are slow but certain; and time, instead of proving the six-cylinder car only a fad, will demonstrate conclusively its superiority over the four. But I am talking mechanics—and Mr. Waldon is a salesman. The salesman watches the trend of public sentiment—the designer works only for results, and if he reaches his goal he finds sentiment and demand following him closely. Come to think of it, possibly six-cylinders are a fad—which is another way of saying very popular. Our sales department tells us it is easy to sell a superior product. We have never had to do so, but we have noticed that it takes a lot of bolstering to support an obsolete model. Some designers and some excellent salesmen fail to rate Mr. Average Buyer at his true worth. He wants the best value for his money, and somehow he has an unerring faculty for finding out just what that is. And he does not always ask whether there are more of his choice type of car in use—if he did he would still buy a "one lunger."

Now to clarify the atmosphere and settle this question in a way that will appeal to the salesman and prove in which type of car the buyer gets most for his money, wouldn't it be a good plan to have a friendly test, similar to the English one, between the foremost American representatives of the two types—the Packard four and the Ford six? "Barkis is willin'."

Detroit, Mich. HENRY FORD.

LETTERS INTERESTING AND INSTRUCTIVE

Installing a High-tension Magneto.

Editor THE AUTOMOBILE:

[482.]—I have a small four-cylinder car of 18 horsepower and have had a lot of trouble with the ignition system. I would like to install a high-tension magneto, but do not know if it is possible. Will you kindly tell me what magnetos there are suitable to install in my car, giving make, price, size, etc. I have a four-part coil on the car, and would like to know if I could use the same coil, commutator and spark plugs with a magneto. Which is the better gearing, chain or belt? A SUBSCRIBER.

New York City.

There is no reason why you should not be able to install a high-tension magneto in place of the present ignition system of your car, though it will cost some money to have the remodeling done in a proper manner. It would be a violation of our rules to give specific information as to makes and prices in this column, and we would suggest reference to our advertising pages and correspondence with manufacturers for such detailed data. It is hardly likely that you could use the present coil, commutator, etc., in connection with a magneto, and the fact that you mention these elements suggests that perhaps you have in mind the use of a dynamo. This idea seems further indicated by your questions concerning chain and belt drive. It is not practical to drive a magneto other than by perfectly positive means, such as spur or other gearing, though a very tight chain might be made to do in a pinch. This is because a magneto develops its current in a series of surges, which regularly rise to their maximum at certain points in each revolution, so that it is necessary for these periods to coincide exactly with the moments when sparks must occur within the cylinders. Consequently, some sort of fixed gearing to the engine mainshaft is absolutely essential. A dynamo may be driven by belt or friction pulleys, and usually is provided with some means of governing its speed within certain limits, irrespective of the speed of the motor.

Some More Detail of Engine Design.

Editor THE AUTOMOBILE:

[483.]—Being a constant reader of "The Automobile" ever since it was first published, I have taken the liberty to ask you the following questions: Is there any advantage of a mechanically-operated inlet valve over one that is operated automatically on a gasoline marine engine; if so, I would like for you or some of your readers to explain in what way. I would also like to know how to find the approximate horsepower of a gasoline engine 5 x 5, 5 1-2 x 6, and 6 x 6, with flywheel weighing about 100 pounds and turning 500 r. p. m. Will two cylinders 5 x 5 give double the power of one cylinder 5 x 5, both having the same speed and flywheel?

Baltimore, Md. FRED FADUM.

The chief advantage of a mechanically-operated inlet valve over an automatic inlet valve is that the former is positively operated at the right time under all conditions, while the latter may stick upon its seat or open at the wrong time if the tension of the controlling spring is wrong. On a marine engine, which is required to be particularly reliable, the mechanically-operated valve is considered by all means the best. With an automatic valve, the spring tension must be great enough to cause positive closing at the end of the induction stroke, but if it is this strong there is likely to be delayed opening of the valve, with consequent failure to inspire a full charge. A five by five engine of the type you describe, and of ordinary construction, will give about seven horsepower, a five and a half by six about nine and one-half horsepower, and a six by six about twelve horsepower, at five hundred revolutions to the minute. Two cylinders, of any size, will, of course, give twice the power derivable from one cylinder of the same size under similar conditions. The weight of the flywheel makes no difference in the power output, its steadying effect serving simply to deliver the power at a uniform instead of at an irregular rate.

Gasoline vs. Kerosene and Their Heat Units.

Editor THE AUTOMOBILE:

[484.]—Kindly advise through your paper the relative percentages of heat derived from gasoline and coal oil burned under same conditions by burners now used under boilers. P. WADE.

Washington, D. C.

The calorific value of gasoline is variously stated to range from 18,000 to 21,900 British Thermal Units to the pound of liquid—varying probably with the quality of gasoline under test. Kerosene ranges up 24,000 British Thermal Units to the pound, and these figures may be taken to express the comparative heat values of the two fuels, kerosene being materially the better. Of course, since no engine has an efficiency of one hundred per cent., the greater available power in an engine or burner may be secured with the weaker fuel, everything depending upon the condition of practical operation. Kerosene tends towards deposits of soot, resulting from imperfect combustion, with consequent waste of heat units. Gasoline is easier to utilize efficiently. No definite figures can be given without definite data, and the efficiency of a burner can be determined satisfactorily only by test.

Designing an Engine for an Auto.

Editor THE AUTOMOBILE:

[485.]—Please give me through your columns the best valve setting for a 5 x 6 double-opposed engine, running at about 600 revolutions per minute; also, what compression space should this motor have, what size valves, what lift, and what horsepower will it develop? J. K. SEVERSON.

Madison, Wis.

There is so little uniformity in automobile-engine design, it is not possible to give you exact details for your proposed engine, without their being such as might be open to the criticism of some very good engineers. The best plan for you to follow is to copy the practice indicated in some engine similar to the one you propose to construct, and made by some good designer. In a general way, it may be said that at the comparatively low speed you have in contemplation the valves may be smaller than would be necessary for a larger motor. Large valves with slight lift make the least noise, and are the easiest to actuate effectively at high speeds, but smaller valves with large lift can be made to give the same area of opening, and are, of course, held with less pressure on their seats under given circumstances. Usually the exhaust valve, if of the same diameter as the inlet valve, has about twice the lift, so as to insure quick discharge of the burned gases. A compression space equal to about one-fourth of the volume swept by the piston will give you a compression about uniform with that of the best current practice. The horsepower developed should be about fifteen at six hundred revolutions to the minute, but might easily run up to eighteen or more at higher speeds.

Some Peculiarities of the Vibrator.

Editor THE AUTOMOBILE:

[486.]—Will you answer the following through your valuable paper, "The Automobile":

When I throw on the switch on my car one vibrator will vibrate very strongly immediately when the switch is turned on, but in just a short time it will die down and stop vibrating. The car is a Reo two-cylinder touring car. Will you also give me a good rule to go by to set the vibrators. O. J. WORKMAN.

From your statement of the difficulty, it would appear that the dry cells commonly used as the source of current in cars of the type you have are run down, and need to be replaced by new ones. It is characteristic of the ordinary dry battery that, as it becomes exhausted, it recuperates slightly after periods of rest, in which condition it will continue to give current for a few moments. One of your vibrators is probably adjusted with a greater spring tension than the other, so that the current be-

comes too weak to work this one, while still remaining strong enough to keep the other going. Replacement of the cells will remedy matters, but nevertheless you should have both vibrators adjusted the same, to insure an equality of conditions all around. In setting the vibrators, there are two things to be adjusted—the amplitude of vibration permitted between the magnet and the contact point, and the spring tension on the vibrator blade. There is no fixed condition of adjustment that is right for all circumstances, and it is especially likely that the adjustment may have to be changed from time to time to suit varying current intensities. A vibration of large amplitude, with a heavy spring tension, can be utilized only when the current is fairly strong, but usually insures better ignition. Reducing the amplitude and lightening the spring tension will make it possible to get along with less current, but lessens the effectiveness of the ignition. This is largely because of the slower rate of vibration, reducing the number of sparks that occur at the plug during the moment of commutator contact. Because of magnetic and mechanical lags in the igniting system, any adjustment of the vibrator is likely to derange the timing, and consequently should be followed by resetting of the commutator position, in relation to the marks provided on the flywheel. A full discussion of timing is given in the answer to question 467, in THE AUTOMOBILE, issue of November 15, 1906, to which our correspondent is referred.

Identification of Cars by the Radiator Patterns.

Editor THE AUTOMOBILE:

[487.]—I am a constant reader of "The Automobile," and am interested in being able to distinguish machines as they pass me on the street. There are getting to be quite a few machines with radiators and hoods (my usual way of distinguishing the cars) like the Mercedes. Have you ever, previous to the summer of 1905, published illustrations of the different tpes of radiators? Am also interested in learning the name of the car that uses a radiator with the top of its front capped by a broad strip of brass, below which the tubes are set at angles of 45 degrees and cross each other, forming diamond-shaped squares in appearance?

New York City. H. HART.

The fault in identification that you bring out is pretty general with all, and from the same causes. Because of this it has been discarded, except in some few cases like the C. G. V. and the Renault, by a member of THE AUTOMOBILE staff, and in its place identification is established by means of the hub caps. This does not work in every instance, but is generally effective, as you will find by trying. Illustrations of radiators, as types, have appeared in THE AUTOMOBILE from time to time for several years past. The only radiators of the kind you ask for that come to mind are a few specials that were built and exhibited at the shows two years ago.

WHO WINS THIS $100 PEDERSEN PRIZE?

Editor THE AUTOMOBILE:

[488.]—Before the Vanderbilt Cup Elimination race, we offered a cash prize of $100 to the mechanic of the first car equipped with any of our oiling devices to finish in the trial. At that time three Frayer-Millers, the Matheson, and Christie cars were equipped with our lubricating systems. Just previous to the race the Haynes Company bought one of our oilers, fitted with a hand pump, to supplement the oiler already on the car.

The question has arisen as to whether the Haynes mechanic is eligible to the prize, owing to the fact that this car also carried an oiler of another make, besides our own.

We would be pleased to hear from anyone having an opinion on this subject, as we wish to make the award as soon as possible, but do not feel confident enough in our own minds to decide this matter, and would like to have the ruling of some disinterested parties. If you personally have an opinion on this subject, or know of any of your readers who would care to help us in the matter of advancing their opinions, we would be pleased to hear from them, as any argument, that might be advanced would be of assistance in making up our minds on the subject.

PEDERSEN MANUFACTURING COMPANY,
Lorillard Spencer, Jr.,
New York City. Treasurer and General Manager.

A CORRECTION FOR MR. JOHNSON.

Editor THE AUTOMOBILE:

[489.]—In your issue of November 15, page 642, the types made me say: "His experience shows that six cylinders of moderate dimensions are better from every point of view than four cylinders." I wrote: "than four cylinders of very large dimensions."

It is significant to note the reference to six-cylinder cars in that identical issue of "The Automobile." On the first page is an article on the 1907 French models, "A large number of firms will produce six-cylinder machines." On page 2 are mentioned the following leading French and German makers who are building six-cylinder cars: Darracq, Mors, Hotchkiss, Mercedes, Bayard-Clement, Leon Bollee, Itala. Page 3, the Gaillon Hill climb was won by the eight-cylinder Darracq, with a six-cylinder Napier second. There was also entered a six-cylinder Bayard-Clement, which ran into a cart and was prevented from starting by bent steering gear. On page 33 of the same issue it is stated that a six-cylinder, 60-horsepower Fiat will be exhibited at the Garden in January.

The splendid performance of the six-cylinder Franklin across the continent settled for all time any question of the practicability of the six-cylinder engine. Enough said!

Los Angeles, Cal. LLEWELLYN H. JOHNSON.

BOOKS ON AUTOMOBILING.

A Work That Will Readily Commend Itself.

"Krausz's A, B, C of Motoring," just published by Laird & Lee, Chicago, contains a dictionary of automobile terms, a synopsis of the development of the motor car, description of autocar types, the anatomy of the gasoline automobile, and full details of all the various parts and mechanisms. Chapters on the care of the automobile, troubles of the road, the art of driving, and automobile etiquette, are especially timely. In addition there is a voluminous appendix containing racing statistics, track and race records to date, together with detailed information regarding frontier regulations for foreign travel, etc. A feature of the book is a compendium of automobile laws in all the different States. The book is illustrated with half-tones, and has 256 pages, printed on heavy enamel paper. Bound in black morocco leather, $2; cloth, $1.

Handy Compendium for the Automobilist.

"Krausz's Complete Automobile Record," published by Laird & Lee, of Chicago, is designed to furnish the autoist with a complete record of expenditures and other information that will interest every motorist. An appendix gives the automobile laws of thirty-five States, together with the names of those States which have no automobile laws. The book is album shape, 144 pages, bound in full red leather, price $1; cloth cover, price 50c.

Fine Show Number of a German Contemporary.

A most excellent special issue is that of *Der Motorwagen*, describing the Berlin show. Halftones in colors artistically illustrate the leading models displayed at the show, which was the most successful ever held in Germany. *Der Motorwagen* is in the top rank of European automobile publications, its publication offices being in Berlin.

The December number of the *American Magazine* contains a story entitled "Mile-a-Minute Madness," by Walter Prichard Eaton. Of course it is a description of the Vanderbilt Cup race, and exceedingly well written.

NEXT YEAR'S GRAPHIC CHALLENGE RACE.

It has been decided by the Automobile Club of Great Britain, says the *Auto Motor Journal*, to adopt for this race in the future the following formula in regard to the qualification of cars taking part in the race; the cylinder diameter of inches squared, multiplied by number of cylinders, must not exceed 125. It has also been decided to admit steam cars on a basis to be settled later.

MEN AND TEAMS AT WORK IN THE GRAVEL PIT AT COYOTE, CAL., OBTAINING MATERIAL FOR THE MONTEREY ROAD.

PRACTICAL WORK BY PROGRESSIVE CLUBS

Cornerstone of Chicago Clubhouse to Be Laid Dec. 8.

CHICAGO, Nov. 26.—Details of the ceremony of laying the corner stone of the Chicago Automobile Club's new home have been arranged by the committee appointed for the work and the ceremony will be held December 8. The evening previous there will be a smoker and vaudeville performance at the Auditorium Hotel, and prior to the next day's function an auto parade through the city's principal streets will be held. Special committees will have charge of the arrangements for interior work on the building. A loan of $55,000 has been negotiated with the American Trust and Savings Bank of Chicago, a first mortgage on the real estate and the clubhouse having been given as collateral. The financial work was carried out by the Chicago Automobile Auxiliary Association, an organization subsidiary to the club itself. It was anticipated that the cornerstone would be laid on Thanksgiving Day, but the contractors were not sufficiently advanced in their work to make this possible, so the new date was set. Work will be pushed with all speed so that as much as possible can be accomplished before weather conditions become unfavorable.

President Cobe has appointed the following committees to take charge of the various phases of club life for the coming year:

Runs and tours—Joseph F. Gunther, Henderson D. Graff and C. A. Coey.

Racing—C. E. Gregory, Carroll Shaffer and Clinton S. Woolfolk.

Legislative—Sidney S. Gorham, L. E. Myers, La Verne W. Noyes, Graham H. Harris and Andrew H. Sheriff.

Good roads—Harry J. Powers, F. K. Hoover and Harold E. McCormick.

Membership—T. J. Hyman, Elmer H. Adams and Harry J. Powers.

Auditing—Oscar G. Foreman and A. C. Frost.

Entertainment—S. K. Martin, Jr., B. H. Marshall and Robert Tarrant, Jr.

New Clubhouse—W. G. Lloyd, Frank H. Pietsch and John R. Thompson.

California Club President a Volunteer Roadmaster.

SAN JOSE, CAL., Nov. 22.—President George B. Polhemus, of the Santa Clara County Automobile Club, is an official whose example in the cause of road improvement is worthy of emulation. In Santa Clara county, as well as in other counties up and down the coast, the roads are in poor condition, especially since the rainy season started. The county supervisors have been working with men and teams, but the task is a big one, and in order to relieve the county officials of a considerable portion of their work, Mr. Polhemus volunteered to take charge of the six-mile stretch of Monterey road from Edenvale to over Coyote Hill. He was appointed a regular roadmaster, but without salary, and since he has had charge the highway has been greatly improved. He superintends the work personally every day in his Winton, directing the progress of the twelve men and teams engaged in the work. The stretch of road between Edenvale and this city is also being repaired and freshly graveled. The road above mentioned is a part of the famous highway from San Francisco to Los Angeles, and the route over which thousands of autos pass every year.

The Santa Clara Automobile Club is built upon a practical basis. Its members believe in doing something to better conditions hereabouts on the highways, and the president's active lead has aroused great working enthusiasm. The membership now numbers 130 and is growing rapidly.

S. B. Stevens and R. L. Morrell in New York Motor Club.

NEW YORK, Nov. 27.—Widespread interest is manifested in the announcement made the latter part of last week by the nominating committee of the New York Motor Club that Samuel B. Stevens, of Rome, N. Y., and Robert Lee Morrell, ex-chairman of the Racing Board of the American Automobile Association,

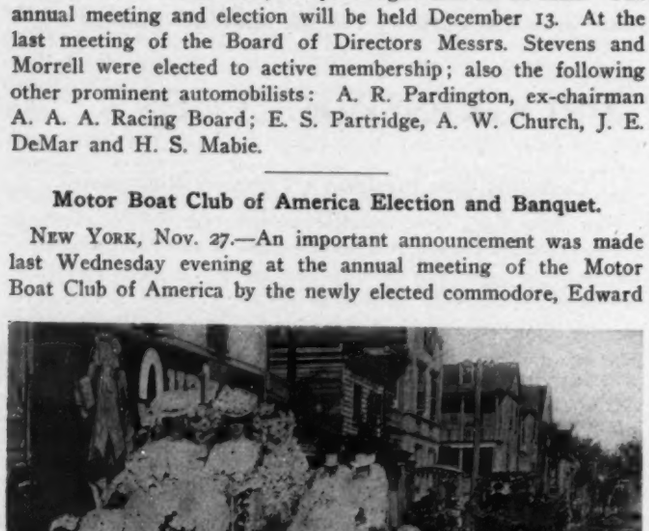
REPAIRING THE MONTEREY ROAD FOR THE WINTER SEASON ON COYOTE HILL, NEAR SAN JOSE, CAL

had been selected for the presidency and first vice-presidency, respectively. Both men have been prominently before the automobiling public for a number of years and are recognized as leading authorities on matters pertaining to autoing. Mr. Stevens is an experienced tourist and racing driver, and also has a comprehension of the necessities of the hour in legislative and highway improvement matters. Mr. Morrell is conversant with matters pertaining to the competitive side of the sport, and the pair should form an official combination at the head of the club of exceptional power for the good of automobiling in general.

The other nominations announced by the committee are as follows: Second vice-president, Frank J. Griffin; treasurer, Richard H. Johnston; secretary, A. B. Tucker; directors, W. J. P. Moorer, H. G. Howell, W. J. Morgan and A. L. Kull. The annual meeting and election will be held December 13. At the last meeting of the Board of Directors Messrs. Stevens and Morrell were elected to active membership; also the following other prominent automobilists: A. R. Pardington, ex-chairman A. A. A. Racing Board; E. S. Partridge, A. W. Church, J. E. DeMar and H. S. Mabie.

Motor Boat Club of America Election and Banquet.

NEW YORK, Nov. 27.—An important announcement was made last Wednesday evening at the annual meeting of the Motor Boat Club of America by the newly elected commodore, Edward



FLORAL PARADE PRIZE WINNERS AT CHARLESTON, S. C.
Photo by T. B. Paine, Jr

J. Schroeder. He stated in his speech of acceptance that he would send his fast motor boat *Dixie* to England to compete in the international race of Cowes for the Harmsworth Cup next August. America was not represented in the race last year, but the year previous, the first one run, the *Challenger*, owned by the retiring commodore, A. D. Proctor Smith, was a competitor.

Mr. Smith declined a re-election, and Mr. Schroeder, who has been one of the most representative workers in the club, was unanimously chosen as commodore, as were the following other officers: Vice-commodore, Joseph H. Hoadley; rear-commodore, Dr. Seymour Oppenheimer; secretary, Hugh S. Gamble; treasurer, Charles Francis; board of governors, John D. Roach, Dr. Louis Neumann, E. A. Stevens, Jr., Charles Boucher and Frank D. Gheen.

The annual dinner of the club was held Saturday evening, November 24, at the Hotel Astor, and was attended by the winners of the various events held during the September races of the club as guests, and a number of prominent naval officers and representative motor boatists. Addresses were made by Rear Admiral Joseph B. Coghlan, U.S.N.; Louis Nixon, Hon. T. S. Southgate, of Virginia; Commodore Schroeder and Vice-commodore Hoadley. The menu was an elaborate one. Rear Admiral Coghlan was accompanied by a number of his staff officers.

Milwaukee Automobile Club Adopts a New Emblem.

MILWAUKEE, WIS., Nov. 26.—At the last monthly meeting of the Milwaukee Automobile Club an official insignia was adopted for use on buttons and cap pins of the members. The new design is circular, representing a tire in gold upon which the name of the club is set in black enamel, and in the center is set the club monogram, "M. A. C.," in red, white and blue letters.

It was decided to hold meetings every two weeks during the winter, at each of which some entertainment feature will be provided. Scientific and technical lectures will be given on automobiling subjects, and the matter of highway improvements exhaustively treated by competent authorities. Three new members were added to the roll.

CLUB DOINGS IN GENERAL.

PHILADELPHIA, PA.—The newly-organized Quaker City Motor Club has established permanent headquarters at New Bingham House, parlor H. The executive department of the club is looked after in a clerical way by Theodore B. Creamer.

POTTSVILLE, PA.—At a meeting of automobile owners of Pottsville and vicinity, held November 14, a permanent organization was formed under the name of the Pottsville Automobile Association. W. L. Krahmer, of this city, was elected to the presidency. The new club will make a strenuous effort for improved highways throughout Schuylkill county.

GALVESTON, TEXAS.—A meeting of automobilists held in this city November 15 resulted in the formation of the Automobile Club of Galveston, and permanent organization was effected by the election of the following board of officers: President, M. O. Kopperl; vice-president, H. T. Adriance; secretary and treasurer, E. H. Labadie; captain, George Clough.

BUFFALO, N. Y.—At the meeting of the Board of Directors of the Automobile Club of Buffalo, November 22, the following nominations, which are equivalent to election, were made: President, Seymour P. White; vice-president, F. B. Hower; secretary, D. H. Lewis; treasurer, J. M. Satterfield; board of directors, E. R. Thomas. Edward H. Butler, Charles Clifton.

BOSTON, MASS.—The directors of the Bay State Automobile Association have voted to establish a ladies' restaurant in the Dartmouth street clubhouse, and confer upon the wives and daughters of club members and their women friends clubhouse privileges. George W. McNear has been elected to fill the vacancy on the board of directors caused by the resignation of E. A. Gilmore.

ALBANY, N. Y.—At the annual meeting of the Albany Automobile Club, November 12, twenty-five new members were elected and the following board of officers chosen for the ensuing year: President, Archibald J. McClure; vice-president, M. L. Ryder; secretary, Chauncey Hakes. The executive committee appointed consists of O. A. Quayle, J. B. Taylor and E. G. Cox; the legislative committee, O. A. Quayle, E. G. Cox, Robert Steele, John Dewitt Peltz and M. L. Ryder.

SAN FRANCISCO, CAL.—The Automobile Club of California, the senior organization of the Pacific coast, has taken a determined stand against racing for records over the roads of the State between this city and Los Angeles. The club is of the opinion that these record trials are detrimental to the best interests of automobiling, dangerous to the public, and are apt to result in drastic legislation against automobilists in general if persisted in. Sentiment is somewhat divided here in reference to the club's action, but the majority of people think the club's position the right one.

THE CAR OR THE MAN—WHICH?

By THE SHOP-MAN.

There are all kinds of automobiles—good, bad and indifferent; but even the best of them require some intelligent care.

It was only yesterday that the owner brought in a four-cylinder car of one of the leading makes. He had been driving it only a few months and was loud in his denunciation of it, saying that its makers ought to go into the wheelbarrow business.

I told him I was rather surprised, and that in my experience I had never seen any of such cars go wrong from any faults of their own. I immediately set about to diagnose the case. Such a mess! There were enough things wrong with this car to put a half dozen cars out of business, and the wonder is how any car could persist in going at all under such conditions, but this one did, and it speaks well for the car.

In the first place, one of the storage batteries had been removed, and the one remaining registered somewhat under the limit at which satisfactory results could reasonably be expected. Drivers should not forget that a sufficiently hot spark cannot be obtained without ample strength in the batteries to produce it.

Of the vibrators on the spark coils, two were set correctly, but the other two were badly out of adjustment, which caused two of the cylinders to fire late, if they fired at all, in either case causing a loss of power as well as causing the engine to pound. The platinum points on the vibrator screw were pitted and dirty, and it would not be unreasonable if they prevented any spark at all. Vibrator points should be examined frequently, and when bunches or knobs form on the platinum points they should be dressed down with fine emery cloth or fine file.

The strainer where the water enters the radiator through the pipe from the pump was clogged with dirt and lint to such an extent that the water circulation was almost entirely obstructed. This, of course, prevented a free circulation of the water, and the inadequate circulation permitted the cylinders to heat, and that in turn caused carbon deposits on the piston heads. When a heavy coat of carbon is deposited on the piston heads, it naturally becomes very hot in a short time and explodes the charge before the piston is on center—before the gas is compressed, producing the same effect as when the spark is advanced too far. This is not only very injurious to the bearings and causes the engine to pound, but greatly lessens the power, because the motor must first overcome the force of the explosion and the expansion of gas before it can commence on its working stroke.

Three of the inlet and two of the exhaust valves were badly out of time. What effect this had on the running of the motor and its development of power can be readily imagined.

The owner also complained that the brakes refused to release, but an investigation quickly revealed that the bearings of the several joints had evidently never received a drop of oil since the car left the factory, and some of the friction surfaces had actually rusted. No wonder the brakes wouldn't release. It was not a case of "wouldn't," but a case of "couldn't."

He was unable to release the main clutch for the same reason—lack of oil. He said he didn't know it ought to be oiled. It seems strange that so many motorists cannot be made to understand that judicious lubrication is the most essential thing to the proper running of an automobile, and that wherever one surface moves upon another it must have oil— *oil*, OIL, **OIL**.

Next came the carbureter. That didn't work right either; and its irregular action caused the engine to miss explosions frequently. But the remedy was easy; the cause was nothing more or less than a little dirt in the inlet valve. How it got there I, of course, am not prepared to say, but probably because the gasoline was not strained when placing it in the tank. *Dirty gasoline will always cause trouble. Don't forget that.*

The foregoing is simply an outline of the main troubles with the car in question, but by no means all of them. It had simply been abused and seemed to have received no attention or care at all since it left the factory. It required only a few hours to go over the car and put it in shape, and when it was again turned over to its owner it run as smoothly and almost as silently as a sewing machine.

When you consider the average person who drives an automobile, and the care (?) he gives it, the wonder is not that the automobile gives so much trouble, but that it *causes so little.*

If your car goes wrong, don't condemn it too quickly. Maybe it isn't the *car's fault;* maybe it is *your own.* Remember there is nothing mysterious about an automobile. It is not subject to fits and spells. Cars are supposed to run right when they leave the maker, and most of them do. Some of them may get "out of whack" more easily than others, but one thing you can depend upon, and that is if a car ever did run right, it will do it again, and always will do it under the right conditions. When it runs badly it is up to the owner to use his head, find out what is wrong and correct it. The car or the man—which? It is usually the man.

THE AUTOMOBILE CALENDAR.

AMERICAN.

Shows.

Dec. 1-8.....—Seventh Annual Automobile Show of the Automobile Club of America, Grand Central Palace, New York City, under the patronage of the American Motor Car Manufacturers' Association.

Jan. 12-19.....—Annual Automobile Show of the Association of Licensed Automobile Manufacturers, Madison Square Garden, New York City.

Jan. 21-28.....—Los Angeles, Cal., Morley's Rink, First Automobile Show of the Automobile Dealers' Association of Southern California.

Feb. 2-9.....—Chicago Automobile Show, Coliseum and First Regiment Armory. S. A. Miles, manager, 7 E. 42d Street, New York City.

Feb. 11-16.....—Detroit, Mich., Sixth Annual Automobile Show, Light Guard Armory, Tri-State Automobile and Sporting Goods Association. E. E. McMasters, manager.

Feb. 18-23.....—Fifth Annual Automobile Show, Buffalo, Convention Hall. D. H. Lewis, manager, Teck Building, Buffalo.

March 9-16.....—Boston Automobile Show, Mechanics Hall and Horticultural Hall, Boston, Automobile Dealers' Association. Chester I. Campbell, manager, 5 Park Square, Boston.

April 6-13.....—Montreal, Canada, Second International Automobile and Sportsman's Exhibition. R. M. Jaffray, manager, 309 W. Notre Dame Street.

Apr. 8-13.....—Pittsburg, Pa., First Annual Show of the Pittsburg Automobile Dealers' Association, Duquesne Garden.

Race Meets and Hill Climbs.

Nov. 29.....—Riverside, Cal., Thanksgiving Day Hill Climb, Box Springs Grade Hills.

Jan. 22-26.....—Ormond-Daytona (Florida) International Race Meet, Florida East Coast Automobile Association.

Motor Boat Races.

Jan. 29-Feb. 1..—Palm Beach, Fla., Annual Races of the Palm Beach Power Boat Association.

Sept. 2-6.....—Jamestown (Va.) Exposition, Motor Boat Races.

FOREIGN.

Shows.

Dec. 7-23.....—Paris, Ninth Annual Salon d'Automobiles, Grand Palais.

Dec. 15.....—Calcutta, India, Exhibition of Automobiles, etc., Automobile Association of Bengal.

Feb. 1-9.....—London, Crystal Palace Motor Show.

March 7-16.....—London, Olympia Commercial Vehicle and Motor Boat Show.

April 6-13.....—London, Agricultural Hall Motor Show.

Reliability Runs, Race Meets, Hill Climbs, etc.

Dec. 1.....—La Coupe de Salon Motor Boat Race.

April 21.....—Targa Florio Tour (Sicily), Auto Club of Milan.

May 29-June 1..—Irish Automobile Club Reliability Trials.

June 24-29.....—Scottish Reliability Trial, Scottish Automobile Club.

THE AUTOMOBILE

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" " This Issue,	- - - - - - - - - - - -	16,500
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Marked Progress as Told by the 1907 Shows Despite the often-asserted and perhaps not unreasonable contention that improved automobile models should be brought out as frequently or as infrequently as the mechanical progress of the industry seems to warrant, instead of arbitrarily every year, it is clear that the 1907 shows will continue to define the definite achievement of the preceding twelvemonth.

Standardization seems more intrenched than ever, and may be safely characterized as the keynote of the existing situation, meaning as it does refinement in details rather than radical changes away from the fundamentals of accepted design. Besides the increasing use by foremost manufacturers of stock parts, provided by specialists in certain branches of the general field, there is also a most manifest tendency toward the use of parts exactly conforming to established details, even when these are made by the builder of the car on which they are used.

Probably the most unsettled details of the modern car, if judged by the variety of constructions and the number of changes, have to do with methods of cooling and methods of carburetion. Several prominent manufacturers of air-cooled engines have commenced the construction of water-cooled models; while some of the foremost advocates of water cooling show a significant interest in the simpler system. While it remains true that most of the larger and more expensive cars are propelled by water-cooled engines, the fact remains that in the air-cooled ranks are to be found vehicles capable of giving most practical results under extraordinarily strenuous conditions.

In the matter of carbureters, it is evident that the eminently satisfactory results of the best current practice have been achieved only by exhaustive consideration of a host of complicated factors, and that anything less than the most perfect design fails to meet the exceedingly exacting requirements. That these considerations are generally recognized by manufacturers of cars is abundantly proved by the prevailing use of nothing but the best carbureters, the altogether inadequate devices of earlier years having been discarded for constructions that come nearer meeting engineering approval.

The tendency in ignition systems, while not yet settling to a decision between the merits of the jump-spark and the make-and-break, nevertheless is toward marked improvement, and better insulation, more substantial plugs, coils, commutators, etc., together with more reliable sources of current, are the order of the day.

It is more difficult than ever to assign an exact value to the six-cylinder vogue, but it seems reasonable to suppose that the improved torque and balance of this type will more than ever commend it in quarters where cost and a slight additional complication are not important considerations.

Ball bearings of the annular type are achieving a most evident victory, and are applied on cars this year that never used them before. Plain and roller bearings, of course, retain fields of usefulness that are peculiarly their own.

All in all, regardless of less basic improvements that a more or less remote future may have in store, it is safe to say that the modern automobile is well past the last vestiges of its experimental stage, and can be placed in the hands of the average user with every assurance of highly satisfactory results.

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Circuses to Travel in Big Motor Cars. Announcement has recently been made to the effect that Barnum & Bailey's "Greatest Show on Earth" is preparing to tour the country next year and thereafter in a train of mammoth automobiles. To some, probably, this news will at first appear as a new device of the circus press agent; but this is not the profitable season for original pronouncements in the outdoor show business, and further thought of the matter will probably convince that economy and convenience rather than a craze for novelty are dictating this change in circus travel methods.

First of all the expense and risk of railway transportation are both unduly great. To protect themselves the carriers have made the rates for this sort of traffic very high, averaging, so it is said, about $1,000 per day for the Barnum & Bailey organization. Now, $1,000 per day will buy a lot of gasoline. Moreover, the circus organization with its own transportation means will be at a decided advantage when the city where the exhibition is to be held is reached. The railway depot, for example, often located in an out-of-the-way place, perhaps miles from the show grounds, will be cut out entirely. The aggregate amount of travel will be lessened because the trips will be in solid trains, so to speak, from one exhibition ground to another.

It seems to us that this is almost entirely a problem of roads fit for passage, upon the regular schedules which the circus trains are obliged to make—say from April 15 to October 15 in this climate. Certainly the proper vehicles are ready, and capital is always willing to risk itself on a reasonable expectation of success. If the die is cast and the railways should be abandoned in favor of the motor vehicle, then the districts without passable roads would probably be obliged to go without the circus. That would be likely to stir up good roads sentiment in some rural localities that are very indifferent to-day.

An interesting thought in this connection is that the modern circus, in taking again to the roads, will simply be turning back to the original idea of a traveling entertainment. Gradual additions were made to the original circus and distances multiplied, until animal legs and primitive vehicles were no longer sufficient. So the railway became a useful and necessary agency. Now, in further progress the railway is unable to furnish just the right transportation desired, while a new agency—the commercial vehicle—proves itself capable of supplying the full need.

WORKING COMMITTEES OF THE A. M. C. M. A.

James Couzens, chairman of the A. M. C. M. A. Committee of Management, has completed the various working committees of the association, announcement being made of the following:

SHOW COMITTEE.

Benjamin Briscoe, Maxwell-Briscoe Motor Company, chairman,
J. B. Bartholomew, The Bartholomew Company,
A. C. Newby, National Motor Vehicle Company.

TOURS AND RACES.

W. C. Marmon, Nordyke & Marmon Company, chairman,
Benjamin Briscoe, Maxwell-Briscoe Motor Company,
F. M. Keeton, DeLuxe Motor Car Company.

GOOD ROADS AND LEGISLATION.

Charles Lewis, Jackson Automobile Company, chairman,
Jesse Draper, Wayne Automobile Company,
V. A. Longaker, American Motor Car Company.

MEMBERSHIP.

W. H. Van Dervoort, Moline Automobile Company, chairman,
H. O. Smith, Premier Motor Car Company,
Jesse French, Jr., St. Louis Motor Car Company.

PUBLICITY.

Charles E. Duryea, Duryea Power Company, chairman,
R. M. Owen, Reo Motor Car Company,
Louis Sackett, Moon Motor Car Company.

FINANCE.

J. B. Bartholomew, Bartholomew Company, chairman,
R. G. Harrison, Harrison Wagon Company,
John Kane Mills, Dragon Automobile Company.

STANDARDIZATION.

Charles E. Duryea, Duryea Power Company, chairman,
J. S. Cornwell, Marion Motor Car Company,
R. B. Crawford, Crawford Automobile Company.

FREIGHT AND TRANSPORTATION COMMITTEE.

W. G. Morley, Aerocar Company, chairman,
Harry Knox, Knox Motor Truck Company,
S. H. Mora, Mora Motor Car Company.

It has been definitely announced that the automobile luncheon of the American Motor Car Manufacturers' Association will be given at the Hotel Manhattan, Thursday, December 6, at 1 P. M. All the exhibitors of cars at the Palace show will be invited to attend.

ANNUAL BANQUET AND ELECTION OF L. I. A. C.

The Long Island Automobile Club will hold its sixth annual banquet at the clubhouse, No. 360-366 Cumberland street, Brooklyn, December 5. On the same evening the annual meeting and election of officers will be held, for which the nominating committee has named the following ticket:

President, William Payson Richardson; vice-president, Herman A. Metz; secretary, Walter G. Pierson; treasurer, Charles Jerome Edwards; for members of the Board of Governors for two years, C. H. Galt, Alfred Wilmarth, A. R. Pardington; for members of the membership committee, O. P. Humpstone, W. H. Randall.

Mr. Pierson and Mr. Edwards have served in the capacity of secretary and treasurer respectively during the past year.

AUTO WINS GERMAN QUICK STOP TESTS.

BERLIN, Nov. 26.—The Government made tests yesterday on Bismarck Strasse to determine the comparative distances in which automobiles and horse-drawn vehicles could be stopped. The automobile won hands down.

A motor cab competing with a horse cab stopped in five or six yards, against thirty yards in the case of the horse-drawn vehicle. A 50-horsepower automobile running twenty miles an hour was stopped in two feet in competition with a landau drawn by a pair of horses which were trotting fast. The landau went nearly nineteen yards before it stopped.

A motor omnibus filled with passengers was stopped in twelve yards, against nineteen yards for an empty horse-drawn omnibus.

RIDING AND DRIVING CLUB DISSOLVED.

Growing indifference to the horse, as a direct result of the rapid rise of the automobile in popularity, is given as the main reason for the dissolution of the Suburban Riding and Driving Club of New York, an organization that for twelve years has been popular among devotees of the road horse and whose clubhouse in Depot Lane, overlooking Washington Park and the Hudson river, is one of the most beautiful of its kind in the country. In the days when the horse was monarch of the highway the clubhouse was crowded on fine afternoons with riders and drivers; but the advent of the mechanical conveyance has changed this, and the place has long been very quiet—practically deserted. So when it became impossible to secure a new lease on the place for a definite length of time and when the steward, who succeeded his father in the management of the club's cuisine, resigned, it was decided that the club's usefulness was a thing of the past and its dissolution was agreed to. Financially the condition of the organization is excellent, and the assets will be realized upon and the proceeds divided among the members.

NOW KNOWN AS THE WHITE COMPANY.

CLEVELAND, OHIO, Nov. 26.—An important corporate step has just been announced by the White Steamer interests. A new corporation called The White Company has been formed, which will take over the entire automobile business hitherto conducted by the White Sewing Machine Company. The new concern, The White Company, is organized under the laws of the State of Ohio, with a capital stock of $2,500,000, which is held by the same interests that control the White Sewing Machine Company. The officers of the new company are Windsor T. White, president; Rollin H. White, vice-president; Walter C. White, second vice-president; George W. Kelly, secretary; F. M. Sanderson, treasurer. The transfer to the new concern of the various assets relating to the automobile business, including the new factory, patents, and real estate in the various cities where branch offices are maintained is now being effected, and the new company will assume control of the White Steamer business as of November 1, at which date the fiscal year of the two companies commenced.

ITALIAN CLUB FOLLOWS FRENCH CLUB IDEA.

PARIS, Nov. 28.—A despatch from Milan to the *Herald* conveys the following information:

"The committee of the Automobile Club of Italy met to decide to abstain in future from participating officially in the Vanderbilt Cup contests organized by the Automobile Club of America, the latter not having afforded sufficient guarantees. Makers, however, will be free to compete individually.

"It was also decided not to support the initiative of the Automobile Club of Great Britain in its scheme for the construction of an autodrome having a circuit of less than five kilometers.

"Principe Pietro Strozi was re-elected president of the club. The first Sunday in September was fixed for the next Brescia circuit automobile race."

CLEVELAND TRADE ASSOCIATION MEETING.

Officers for the coming year were elected by the Cleveland Auto Dealers' Association at the regular annual meeting held on the evening of November 6, following a banquet. A committee was selected to assume charge of the automobile show in Cleveland; a show manager was not elected, this having been left for a later date. The affairs of the association were shown to be in excellent shape, with encouraging prospects for the future.

The following officers were elected: President, W. D. Price; vice-president, W. L. Colt; secretary, H. M. Adams; treasurer, H. S. Moore; board of directors, W. L. Colt, H. M. Adams, C. M. Brockway, George S. Waite and W. D. Price; show committee, C. M. Brockway, W. L. Colt and George S. Waite.

LIEUT. LAHM TELLS OF HIS AERIAL CUP WIN

AKRON, O., Nov. 26.—Lieut. Frank P. Lahm, winner of the international baloon race for the Bennett Cup, has written a letter to J. A. Swinehart, president of the Swinehart Clincher Tire and Rubber Company, telling of his successful aerial trip. Lieutenant Lahm and his father, Frank S. Lahm, of Paris, own Turkeyfoot Lake, a beautiful inland body of water ten miles south of this city, which was visited by Mr. Lahm and Mr. Swinehart just previous to the race. Lieutenant Lahm in his letter says:

"I have had a regular deluge of cablegrams, telegrams, letters, cards, and visits. A cablegram from the army mess at West Point was especially gratifying. One additional very good reason for being satisfied with the result, is that Major Hersey was with me instead of the French assistant I had intended originally taking. The latter withdrew an hour before the balloon started, but I had an inkling of the fact. So Hersey was there and ready. Hersey's coolness, his knowledge of wind currents, of the stars in keeping our direction, his readiness to cross the channel, all inspired me with the greatest confidence from the start, so now it adds a large measure to my satisfaction to feel that I had an American and not a Frenchman.

"We left the Tuileries gardens at 4:55 P.M. The east wind was blowing, and we started straight west, keeping below 300 meters. About dark we came still lower and did a great deal of guide roping (letting the guide rope, which is about 200 feet long, trail on the ground) before reaching the sea, as our direction was not good and I wanted to delay the balloon as much as possible. I think we passed over Danville (Eure), then caught a northerly tendency, passed over Sisieux, and struck the sea a little to the west of Dives. We then had the Havre lighthouse on our right for some time. We left the coast at 11:15 P. M., and reached the English coast at 3:30 A. M., having had a lightship in view during the preceding hour.

"The crossing was the most beautiful part of a beautiful trip. We seemed to just quietly slip out over the sea, then skimmed along, the guide rope touching occasionally, but when it did I always threw out a little ballast, as our direction (a little west or north) was excellent, and I did not wish to delay our progress. The moon was full and very bright, all the stars were out; it was so mild that I never thought of putting on my overcoat or gloves. Once a little sailing vessel passed under us going in the direction of Havre. Soon after reaching the English coast we passed Chichester, a couple of miles to the west, then continued our course a little west of north. We had a lot of fog and mist even up to 8 A. M., though never getting above 200 meters.

"When daylight came we called down and learned where we were. We had kept such loose track of our direction that it was just a question of knowing how far we had gone. At the same time it looked very much as if we would get to Ireland. The early morning was cloudy, fortunately, so we spun along at a low elevation. This was one of the prettiest parts of the trip; the country was beautiful.

"When the sun began to warm up, I opened the valve at intervals and kept it up for perhaps an hour and a half. The upper current was east of north, while the lower was west of north, which was what we wanted. We had turned more to the north before that anyway, so we had given up the idea of getting to Ireland, and were figuring on reaching Scotland. Once I opened the valve hard enough to bring us clear to the ground, and I believe this maneuver gained a lot of distance for us in the end. That was probably about 10 A. M. Up to that time we had used only 5 1-2 of our 29 sacks of ballast. By 10:30 the run was so hot that we could not stay down any longer, but went up continuously till 2 P. M., when we reached 3,000 meters. The higher we went, the more we kept turning east, but I had decided that at 2 o'clock I would start to let the balloon come down gradually so as to get an equilibrium for the night, near the ground, where the wind was blowing more to the west, and would take us over and up into Scotland. Unfortunately we did not catch that northward tendency soon enough, and as the coast itself cuts into the west up above the hill, the sea showed up straight in front of us.

"Then I had to open the valve hard. We struck a more northerly direction on getting down, so that after striking the moors I let the balloon go on at an altitude never greater than 200 meters, till we had crossed the moors and I saw a little railroad station down by the sea. Then I picked out a good looking farmhouse and let the balloon come down near it. A good 20-mile wind at the ground carried us along at such a good rate that the anchor, which was a very light one, did not catch at all, and I had to make a landing by opening the valve and ripping off the safety strip, finally getting a kilometer past the farmhouse. Neither of us had a scratch, and the balloon was not damaged a particle. The only damage done was twisting the shank of the anchor, which was probably done when it hit one of the stone walls.

"A Mr. Barry, a typical, up-country squire, and the land-owner of the district, happened to be in the field near where we came down. He gave us all of the assistance we needed and was very good to us, even lending me enough English money to get down to York. We landed at 3:12 P. M., a mile from the sea, and a little less from the Flying Hall station, fourteen miles north of Scarborough, Yorkshire. We caught a five o'clock train for York, where we spent the night.

"Major Hersey woke me up by nearly knocking down the door the next morning to tell me that we had won, but, they also said, Rolls had not been heard from. It was not until about 3 P. M. that day, when we got to the Cecil hotel in London, that we read on a ticker that we had won. We came back to Paris Tuesday night. There was a storm on the channel; it was a great contrast to the beautiful crossing we had had two nights previously in the balloon.

FRANK P. LAHM."

FOUR ENTRANTS FOR 1907 BALLOON RACE.

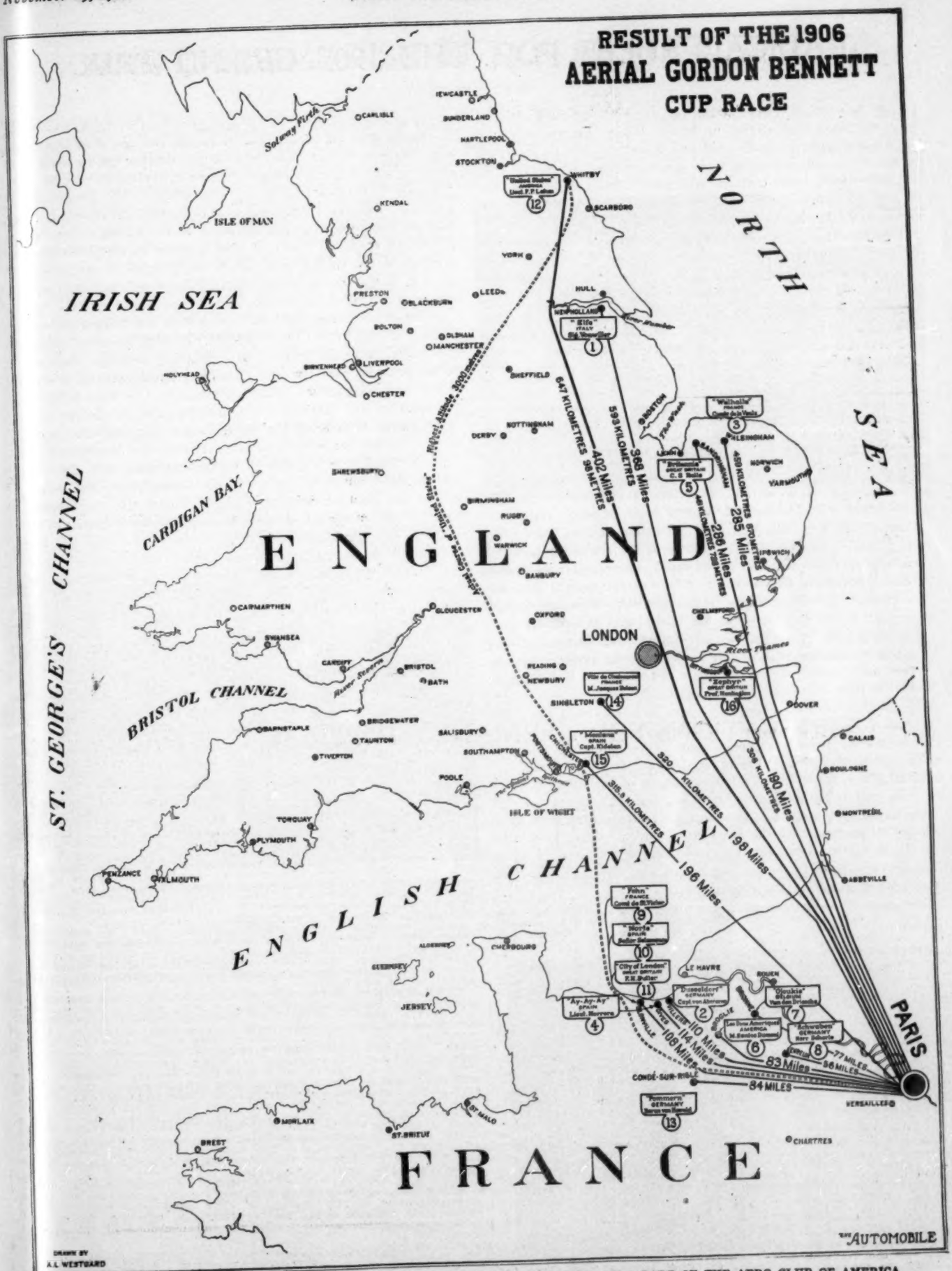
In the next big elimination contest held in this country the great question will not be "How are the roads?" but How's the wind?" for the racers will be balloons, not automobiles, and the course will be free from turns, hills, dust, mud and police traps. Already there are four American entries for the Gordon Bennett International Cup contest for balloons which will be held in this country next year, and as only three representatives from each competing country are permitted, there will have to be some sort of an elimination trial. Lieut. Frank P. Lahm, in winning the contest with his balloon *United States* brought the cup from France to this country. The big trophy is now in the Custom House, and will be exhibited in the aeronautical section at the Palace next week.

A meeting of the directors of the Aero Club of America was held early this week, and the announcement made that applications for positions on the American team had been made by Dr. Julian P. Thomas, J. C. McCoy, Leo Stevens and Charles Walsh. Mr. McCoy holds a certificate as expert pilot from the Aero Club of France, having made the ten ascensions necessary to qualify. Lieut. Lahm will return from abroad in the spring, and it is expected that he will naturally aspire to represent his country again, and there are others whose entries are expected before the lists close in April.

At the meeting of the board of directors the chair was occupied by President C. F. Bishop; Charles J. Edwards, J. C. McCoy, Allan R. Hawley and Augustus Post were the other directors present. It was decided to send representatives to St. Louis to investigate the possibility of storing and filling a big fleet of balloons there. St. Louis has been favorably considered for the starting point of the contest because it will be possible to make very long journeys in any direction, regardless of the direction of the wind. France, England, Belgium, Germany, Spain and Italy have signified their intention of entering teams, so a very large fleet will have to be provided for.

GERMAN GOVERNMENT'S AERIAL ACTIVITY.

BERLIN, Nov. 27.—Despite the recent purchase of the Parseval airship by the Kaiser's technical commission, German military authorities are constructing in secrecy a new and improved airship at the ballooning department at Tegel. The airship will be fitted with all the modern improvements, experience gained in the Parseval and Zeppelin dirigibles being utilized. This vessel will be armed with guns and other means of offence. The technical commission has also offered a certain sum to Count Zeppelin for the purchase of his latest airship. It is not expected, however, that, in view of the small amount offered, Count Zeppelin will accept.



THE ORIGINAL EXPANSIVE MAP FROM WHICH THIS WAS PHOTOGRAPHED WILL BE A PART OF THE AERO CLUB OF AMERICA EXHIBIT AT THE A. C. A. SHOW.

RADICAL RULES FOR THE 1907 GRAND PRIX

By W. F. BRADLEY.

PARIS, Nov. 20.—Regulations for the French Grand Prix of 1907 have been drawn up by the Racing Commission, and after being approved by the full club committee will be published in detail. In their general lines the conditions of the race do not differ from those outlined last week. The race will be run on a short circuit, yet to be chosen, with a total distance of 800 kilometers (497 miles) in one day.

Engagements are received at the ordinary fee of $1,000 per car until February 1, 1907, not more than three machines being allowed from any one firm.

There will be no weight limit or any regulations whatever concerning the construction of the machine. The only condition is that the machines must run the race on a fuel allowance of 30 liters (6.6 gallons) per 100 kilometers (62.1 miles) or 52.8 gallons for the 497 miles of the course.

Competitors may use whatever fuel they desire, gasoline, alcohol, kerosene, the same number of liters being allotted to each machine, no matter what the specific density of the liquid may be. A standard type of tanks will probably be imposed on all competitors; reservoir, feed pipes, carbureter, taps, etc., must all be submitted to the sporting committee before the race, and any attempt at fraud will entail instant disqualification and a heavy fine.

Competitors may take their full allowance of fuel before the race, or may take half their allowance at the beginning and the remainder as they need it in sealed cans. There will only be one gasoline station on the course.

A general opinion in Paris is that the fuel allowance is too generous. On 27 liters most of the 1906 Grand Prix racers covered 100 kilometers, which would indicate that instead of decreasing the machines are likely to increase in power. As one of the principal reasons for changing the regulations was to limit the increase in the horsepower of racers, the new conditions appear likely to defeat their own ends. Veteran racing men are either favorable to the change or refuse to express an opinion.

In case of necessity the mechanic may replace the driver during the race. Reserve drivers will also be allowed on condition that they are registered with and approved by the Racing Commission before the contest. This provision is made as the result of experience in the Grand Prix, where the chances of certain firms were in danger owing to the inability of drivers to continue the severe strain of a long race.

In other particulars the 1907 Grand Prix will remain the same as that of this year. Dismountable rims will be used, changes and filling tanks will be done by driver and mechanic, there will be no controls, and tire and gasoline stations will be at fixed points and common to all competitors.

Conditions for the tire competition remain as already forecast. Machines entering for this test must carry the same makes of tires on all four wheels—mixed sets will not be allowed. If anti-skid bands of a separate make are employed, it is the tires and not the shoes which will count in the competition. The winner will be the machine finishing with the lowest tire consumption, provided its average speed is not less than nine-tenths that of the victor in the principal event.

France is hankering after a speed track; and, curiously, it is the Marquis de Dion, the man who never races, the man who always remains neutral when speed questions come before his committee, who is one of the most ardent supporters of the movement. The Marquis' plan is to construct a 20-mile course in the mountainous Auvergne district, the scene of the 1905 Gordon Bennett struggle.

REGULATIONS FOR GERMANY'S IMPERIAL CUP RACE

BERLIN, Nov. 20.—Preliminary rules have been promulgated by the Imperial Automobile Club for the contest for the cup offered by the German Emperor, to take place in June next after the conclusion of the Herkomer touring competition, and presumably over the Taunus Gordon Bennett course of 1904. Competing cars will have touring frames and racing bodies. The following is the official announcement:

The Imperial Automobile Club will arrange an international race for touring cars in June, 1907. The date and course will be made known later. Distance not to exceed 500 kilometers. Entries are open to manufacturers in all the world. The race is open to cars complying with the following regulations:

(a) The hub volume must not exceed eight liters.
(b) The maximum distance from the back edge of the dashboard to the middle of the rear axle must be two meters.
(c) The wheelbase may not be less than three meters.
(d) The dashboard must be upright.
(e) The distance from the back edge of the dashboard to the back edge of the bucket seats of the two-seated racing bodies may not exceed 1.50 meters.
(f) The height of the two not upholstered seats measured from the edge of the frame may not be less than 325 millimeters.
(g) No conditions govern the position of the petrol tanks.
(h) The cars may not weigh less than 1,175 kilos, including racing body and tires, without petrol, water, and oil, without spares and tools, with oil and grease in the motor and change speed box, with dashboard, bonnet, dustguard under the engine until the flywheel, at least, with exhaust, wood wheels, preventive against accidental reverse, two independent brakes and signal.
(i) There must be a clearance of at least 15 centimeters between the ground and the lowest part of the car.
(k) Every engine must possess a reverse operated by the motor.
(l) Petrol of a specific weight of 680 to 720 alone is permissible as fuel; any additions are forbidden.
(m) Detachable rims are permitted.
(n) The exhaust must be carried horizontally to the rear and may not raise any dust.

Every factory may enter one to three cars. The Imperial A. C. reserves the right, should more entries be received than seem possible to compete, of reducing the limit number from three to two per factory.

The entry fee is 3,000 marks per car; entries must be addressed to the Imperial A. C., 16 Leipziger Platz, Berlin W., up to December 31, 1906, at 6 P. M. Entries are only accepted if accompanied by the necessary fees, and if declared in accordance with the regulations by the Technical Committee.

No fees will be returned on withdrawal of entries, but only in case of the event being declared off owing to insufficient entries. The I. A. C. will decide this.

The names of the drivers must be forwarded registered to the I. A. C. by May 1, 1906, and any later changes are likewise to be communicated. Drivers may not be changed during the race. The Race Committee reserves unto itself the right of excluding a driver from the race before commencement or at any stage on the grounds of danger to the public or competitors.

At the weighing-in the manufacturers must prove by means of official papers that the cars entered are in accordance with the police regulations of their country and the drivers must be able to show their licenses. Place, day, and hour of the weighing-in will be made known later. Every car must carry two persons of normal weight seated side by side.

Every taking-in of fuel (petrol, water, oil, etc.), all changing and repairing (tires, tubes, engine, gear, etc.), may only be carried out by the inmates of the car. Each factory will receive two places on the course, to be decided by a draw, as depots. No workmen or employees of competing firms will be allowed on the route. Fuel and spares may be placed on the roadside, but may only be used by the passengers. It is only permitted to take up tires, tubes, petrol, water, oil, etc., at these depots; transgressions will be followed by disqualification. Non-competing firms interested, such as tire companies and others, can also have two depots en route on a payment of 1,000 marks.

Time and place of the start will be made known later. The order of starting will be decided by ballot.

Any protest must be made in writing, at the latest an hour after close to control to any one member of the race committee and must be accompanied by 300 marks, which will only be returned should the protest be accepted.

The I. A. C. reserves to itself the right of extending, altering, and recalling the propositions. All decisions regarding the race will be made definitely by the committee. The competitors bind themselves to in no case apply to the courts. In entering, the competitors accept the above conditions and decisions of the race committee.

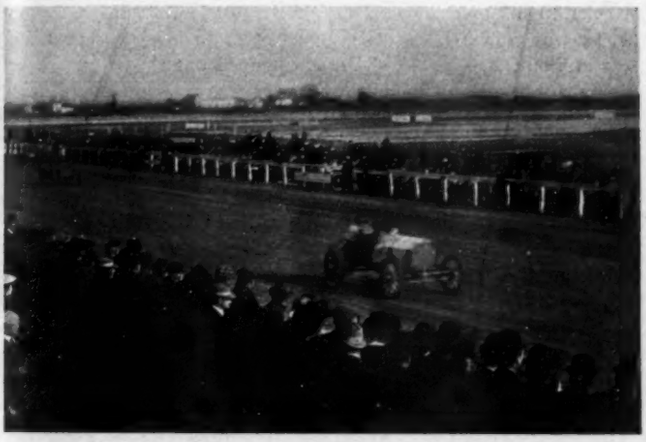
TECHNICAL COMMISSION OF THE IMPERIAL AUTOMOBILE CLUB,
(Signed) Count Adalbert von Sierstorpff.

Berlin, November 13, 1906.

POINT BREEZE'S SENSATIONAL RACE MEET

PHILADELPHIA, Nov. 26.—All attendance records for an automobile race meet were broken on Saturday last, when the Point Breeze track's accommodations proved woefully insufficient for the crowds. Many of the big crowd, which was estimated at considerably over the 10,000 mark, came for sensations, the scare heads in the morning papers of Keeler's death of the day before whetting their appetites for the unusual. And they came near getting it when, in the five-mile open for the *Ledger* Cup, Montagu Roberts' 60-horsepower Thomas skidded in an oil pool at the first turn and dumped its occupants into the chilly ditch water inside the rail; and again when, in the sixth mile of the fifty-mile event, the 60-horsepower Apperson, driven by Phil Kirk, punctured the right front tire just as it was rounding into the home stretch and flew off into a tangent, demolishing half a dozen lengths of fence and sending the White ambulance scurrying from its station to the scene. Fortunately, no one was seriously injured, the occupants of the car getting off with a few cuts and bruises and eight spectators getting a ride to St. Agnes' in the steamer to have slight wounds dressed. The accident prevented a new mark being made for the fifty miles, as afterward it was noticeable that the drivers took the tricky corners very gingerly.

There was much delay in starting the big race, the owners of the nine cars which were eventually lined up, and Mr. Blakely,

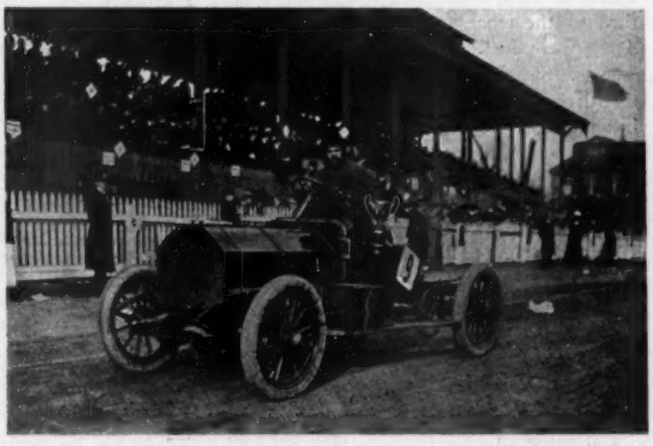


S. H. ELLIOTT IN 30-H.P. PACKARD WINNING 50-MILE RACE.

owner of the 70-horsepower American Mercedes, which had previously walked away with the "Record" Cup in the impressive time of 12:03 3-5, engaging in a talkfest as to the eligibility of the latter. The nine, to a man, positively declared that if the Mercedes was allowed to start they would withdraw, and the officials, after a prolonged council of war, sustained their objections on the ground that the Mercedes was not a stock car, having been built especially for racing purposes.

The nine cars filled the track from rail to rail. The Packards —there were two of them in the race, a 24 and a 30—alternated in the lead for the first ten miles. Up to the tenth mile Johansen in the Stevens-Duryea was seemingly content to trail along fifty yards in the rear of the 30 Packard, but when the figures hung out in the judge's stand showed that the time was almost a minute slower than that for the same event two weeks ago, when the Darracq won, he was ordered to go to the front, which he did in great style, gaining fifty yards on the "30" Packard with each lap. At the half-way point the Stevens-Duryea had reduced the time difference for the two races to less than ten seconds—30:18 as against 30:08 1-5—and led the Packard by over a half mile.

Apparently realizing that when necessary he could increase his lead at will, Johansen slowed down a little, and at the thirty-mile point he was still a good half mile ahead of the Packard, but the time difference had increased to seventeen seconds.



THE APPERSON WINNER WHICH LATER WENT INTO THE FENCE.

Suddenly, just before the completion of the thirty-second mile, Johansen was seen to signal as he passed the Stevens-Duryea control, and everybody there became busy instanter—his right front tire was seen to be flat as he passed the stand and went at a much too fast clip around the dangerous first turn.

With signals of distress flying from the enemy's camp Elliott, in his Packard, immediately sat up, and he and his mechanician began to work like fiends. A cheer which loosened the tin roof on the dilapidated grandstand greeted him as he once more took the lead and started to lap the crippled Stevens. Once, twice, thrice—ten times he repeated the lapping operation before the Stevens got going again. The Stevens camp followers tried first to put on a new wheel, but the old one wouldn't come off. Then they essayed to put a new tire on the old wheel, but something else went wrong. Still Johansen kept them at it, and when he took up the journey, ten miles to the bad, the huge crowd arose up *en masse* and gave the plucky driver the glad hand. He was still going and picking up ground rapidly when the finish gun was fired, being credited with fifth place, the Packard, Mercedes, Berliet and Studebaker finishing ahead of him in the order named. While delighted at his victory, Mr. Elliott was cha-

MONTAGU ROBERTS' THOMAS NOBLY SURVIVED ITS COLLISION.

grined that his time was twenty-six and one-fifth seconds slower than that of the Darracq a fortnight ago. He said that if he had been tipped off at the forty-mile post he could easily have broken the record.

The Buick, after winning the two-mile handicap from scratch, repeated in the five-mile City Championship for the *Bulletin* Cup.

Too much oil on the first turn was responsible for putting the favorite out of the race in the five-mile open for the *Ledger* Cup. Montagu Roberts and Frank Cole, his mechanician, sent a mighty splash of water heavenward as they pitched head first through the fence and into the slimy, ice-cold ditch in the infield. They were lucky to find such a soft place to fall. With the Thomas out of it, the race resolved itself into a test of the relative driving ability of Phil Kirk in the 60-Apperson, Ernest Kelly in another 60-Thomas, and the Berliet, Kirk beating Kelly to the wire by a comfortable margin in 6:04 flat.

The five-mile antique handicap for the *Inquirer* Cup had but three entries, but they were all good cars, and the race looked just like the others, there being little decrepitude in the paces of any of the contestants, despite the condition that no car built later than 1904 was eligible. Charlie Soulas, driving a 24 Pope-Toledo, and starting from the twenty-five-yard mark, finished first, pulling away from the Mercedes 28 (scratch) in fine style and leaving the 10-horsepower White steamer driven by Bobbie Crapp in the rear. The Pope's time was 6:28—going some for an antiquity.

But an even half dozen of the thirteen entrants for the five-mile City Championship for the *North American* Cup faced Starter Wayne Davis, much to the officials' relief. Phil Kirk, who later, in the fifty-mile event, went into the fence, landed this race in impressive style in the fastest time of the afternoon —5:57 flat. Johansen's 50-Stevens was a faster car, but Kirk took chances and beat him out.

An effort was made to exclude E. L. Blakeley's 70-horsepower American Mercedes from the ten-mile race for the *Record* Cup, but as the program listed the race as an "open" one, the protests were unavailing and the car was allowed to start. The fears of the other contestants proved to be well founded, for the Mercedes went to the front from the gun, and not only stayed there, but increased its lead with each mile.

These races have developed what Philadelphia has long needed —a live, hustling, enterprising promoter and manager. Much of the success of the races of the 10th and 24th have been due to the efforts of Race Secretary Theodore B. Creamer. He is an experienced newspaper man, and energetic to a degree. He succeeded in doing what no other local promoter was able to do—he interested the newspapers, not only to the extent of giving considerable space in their columns, but to hanging up cups for the contestants. He is indefatigable, and is already at work on the details of an economy test, to be run under the auspices of the Quaker City Motor Club, which owes its inception and existence to his knack of enthusing others. Possessing the confidence of all the local tradesmen—an impossibility with one in the business—Mr. Creamer is destined to bring Philadelphia to the front as a center of automobile activity ere many months.

Following is a summary of the races:

TWO-MILE HANDICAP, GASOLINE, $1,500 OR LESS—"ITEM" CUP.

1. Buick, 22-h.p. (scratch); driver, W. E. Haupt..... 2:57 1-5
2. Maxwell, 10-h.p. (250 yards); driver, W. M. David....
3. Maxwell, 10-h.p. (250 yards); driver, W. C. Longstreth

FIVE-MILE CITY CHAMPIONSHIP, GASOLINE, $3,000 OR LESS —"BULLETIN" CUP.

1. Buick, 22-h.p.; driver, W. E. Haupt..... 7:03
2. Rambler, 35-h.p.; driver, A. H. Bittner.....
3. Oldsmobile, 30-h.p.; driver, W. Folbrath.....

FIVE-MILE OPEN—"PUBLIC LEDGER" CUP.

1. Apperson, 60-h.p.; driver, Phil. Kirk..... 6:04
2. Thomas, 60-h.p.; driver, Ernest R. Kelly.....
3. Berliet, 60-h.p.; driver, J. L. Dupont.....

FIVE-MILE ANTIQUE HANDICAP, CARS BUILT NOT LATER THAN 1904—"INQUIRER" CUP.

1. Pope-Toledo, 24-h.p. (25 yards); driver, Chas. Soules.. 6:28
2. Mercedes, 28-h.p. (scratch); driver, D. L. Porter.....
3. White, 10-h.p. (150 yards); driver, Bobby Crapp.....

FIVE-MILE CITY CHAMPIONSHIP, STOCK CARS—"NORTH AMERICAN" CUP.

1. Apperson, 60-h.p.; driver, Phil Kirk..... 5:57
2. Stevens-Duryea, 50-h.p.; driver, E. V. Johansen.....
3. Apperson, 50-h.p.; driver, Eddie Wilkie.....

TEN-MILE OPEN—"RECORD" CUP.

1. American Mercedes, 70-h.p.; driver, E. L. Blakeley.... 12:03 3-5
2. Berliet, 60-h.p.; driver, J. L. Dupont.....
3. Stanley, 20-h.p.; driver, Murrell Dobbins.....

FIVE-MILE DEALERS' HANDICAP—"TELEGRAPH" CUP.

1. Stanley, 20-h.p. (50 yards); driver, Murrell Dobbins.. 6:14 1-5
2. Mercedes, 28-h.p. (100 yards); driver, Bennett Porter.
3. Studebaker, 35-h.p. (100 yards); driver, Frank Yeager.

FIFTY-MILE OPEN—"PRESS" CUP.

1. Packard, 30-h.p.; driver, S. H. Elliott.....1:01:46 3-5
2. Mercedes, 28-h.p.; driver, Bennett Porter.....
3. Berliet, 60-h.p.; driver, J. L. Dupont.....
4. Studebaker, 35-h.p.; driver, Frank Yeager.....

Five-mile times:

5 Packard	6:25 2-5	30 Stev.-Duryea	36:27
10 Packard	12:32	35 Packard	43:14 1-5
15 Stev.-Duryea	18:22 3-5	40 Packard	49:23 1-5
20 Stev.-Duryea	24:19 1-5	45 Packard	55:39
25 Stev.-Duryea	30:18	50 Packard 1:01:46 3-5	

ERNEST KEELER'S FATAL FINAL PRACTICE MILE

PHILADELPHIA, Nov. 26.—"Just one more mile," said Ernest Keeler to his mechanician, T. W. Berger, last Friday afternoon as he was finishing the tuning-up process to his big Olds racing car at Point Breeze. And Berger stepped out as the car slowed down, for it was arranged that Keeler was to work alone in the races the next day. Berger strolled away to the Olds control and safety, while Keeler, throwing in the high, sped away upon his last mile. A few hundred yards ahead, jogging along, were James L. Hamilton and Harry Lutton in a Fiat, the former driving; and Herbert Vicner in a Rambler. As Keeler thundered down the home stretch, on the extreme outside, preparing to take the trickiest turn on the track with a wide swing, a big work wagon loomed up just ahead. Hamilton and Vicner swerved their cars to the left to clear the wagon just as Keeler came up. The latter either made a miscalculation or his car skidded, for his front wheels crashed into the Fiat, which in turn was thrown against the cart. The Olds went over and over like a chipped bowling ball, throwing Keeler many feet ahead. When picked up he was apparently lifeless, but when the car which carried him and Lutton, the Fiat mechanician, to St. Agnes' Hospital, he was found to be still breathing. He expired, however, within a few minutes, it having been found by the doctors that the base of his skull was fractured and his collarbone broken. Lutton's skull was likewise fractured and his head badly cut in several places, but it is believed that he will recover. The driver of the work cart was also injured and his horse so badly cut up that he had to be killed. Shortly before midnight G. Hilton Gantert, the local Oldsmobile representative, shipped Keeler's body to his wife in New York City.

Following the accident a hurry call was sent to the officials of the Quaker City Motor Club, under the auspices of which the next day's races were run, and after a long discussion, in which the local police officials took part, it was decided to carry out the racing program as arranged. An effort had been made by certain parties to induce Director of Public Safety McKenty to prohibit the running of the races, but he said that as the competitions were to be held in an enclosure and all reasonable precautions taken to protect the public, the matter was beyond his jurisdiction. Keeler's death, in his opinion, was purely accidental, although an effort will be made to find out who ordered the work cart on the track.

AN IMPORTANT GOOD ROADS REPORT

WASHINGTON, D. C., Nov. 29.—Some important facts bearing on the good roads propaganda are contained in the tenth annual report of Secretary of Agriculture Wilson, which was submitted to President Roosevelt to-day.

Secretary Wilson says that throughout the country there is a steadily growing demand for information as to the best methods of road construction. Considering the country as a whole, it is probably true that in no phase of development are we so backward as in the extension of hard and durable roads. In the cases in which people are willing to expend money on the improvement of their highways it frequently happens that, owing to inexperience and lack of organization, the money is partially or totally wasted. In some communities abundantly able to support a system of good roads very little work is done, owing to a lack of knowledge of what can be accomplished with the resources at hand. It is precisely in cases like these that the work of the Office of Public Highways is proving of signal value. While it is no part of the scope of its work to undertake the construction of roads that can be and should be the care of communities within the States, the educational value of employing expert supervision, as well as, to a limited extent, machinery for the construction of sections of improved roads in different parts of the country, has been amply demonstrated.

The act of Congress making appropriation for the Office of Public Roads makes three distinct requirements in relation to the work to be performed, viz.: to investigate systems of road administration throughout the United States, to give expert advice on road construction, and to investigate the chemical and physical properties of road materials. During the past year the work of the office has been arranged in three general divisions along the lines indicated.

Cost, Methods, Wide Tires, Convicts, Etc.

The office is also collecting information as to comparative cost of road work, methods of building various types of roads, State-aid roads, legislation regarding road management, the value of wide tires, the use of convict labor in road building, cost of wagon transportation, and bond issues for road improvement. Expert advice on road construction has been given and experimental field work carried on by the office. Whenever it is possible and where application has been made in the proper way, object-lesson roads are constructed for the purpose of illustrating the best methods of road building. The local authorities furnish all material, common labor, teams, etc., the office supplying supervising engineers and in some cases part or all of the necessary machinery. In addition to this tests are made to determine the best material available for the road. It frequently happens that these short object-lesson roads have subsequently led to the construction of fine systems of improved roads in the localities in which they were built. During the past fiscal year seventeen roads were built in eleven States, representing a wide diversity in character of construction and kinds of material used.

Automobile Presents Problem in Road Building.

In order to give expert advice on special problems which are continually arising in road construction and maintenance it is necessary to carry on experimental work. During the past year methods of rendering roads dustless have been investigated. The growing use of motor vehicles has presented a new and difficult problem to engineers and road builders. Systematic experiments were carried on at Jackson, Tenn., during the spring and summer of 1905, in cooperation with the city engineer, to determine the value of coal-tar for preventing dust and preserving the surface of macadam roads. Tests were also made with Texas oil and its residuums on earth and macadam roads. The quantity of tar applied per square yard averaged 0.45 gallons and the cost of labor for applying this quantity of tar was less than one cent per square yard. After more than seven months, including the winter season of 1905-6, the tarred roads are still in excellent condition.

Remedies Tried for the Dust Nuisance.

The great demand which exists all over the country for some sort of treatment of road surfaces to suppress the growing dust nuisance has developed a number of materials which it is claimed will answer the purpose. It is to be hoped that careful experiment will show that some material like crude coal-tar, which can be obtained and easily applied wherever there is a gas plant, will prove to be efficient if properly used. It may be said that a large number of trials of crude tar in France and a few in this country, notably the one at Jackson, Tenn., have given excellent results. In other cases partial or entire failure has followed the experiments, and it yet remains to be determined whether the successful use of materials of this nature can be developed. The office will make unremitting efforts to solve this problem by such experiments as can be carried on in different parts of the country in cooperation with local authorities.

During the past year 384 samples were received at the laboratory for routine tests, of which number 273 were samples of rock, intended for macadam road building. A comparison of the demand for tests with the records of previous years shows that it has increased about 33 per cent. A significant fact is that a very large number of samples have come from the Eastern and Middle States, which have not received much assistance in the form of object-lesson roads. This tends to distribute uniformly the benefit arising from the work of the office.

L. I. MOTOR PARKWAY TO BE COAL-TARRED.

One of the most enthusiastic supporters of the Long Island Motor Parkway is E. R. Thomas, the Buffalo manufacturer. In the course of an interview he enlarges upon the construction and benefit of the parkway in this strain:

"The singular fact is that the cost of a motor parkway road may be comparatively nominal. Steam railways, without equipment, cost from $10,000 to $20,000 per mile. Electric railways in proportion. Macadam roads cost from $3,000 to $6,000 per mile, and are soon cut to pieces by heavy steel-tired vehicles drawn by horses with sharp steel shoes. Driving on unpaved country roads, when smooth, dry and not dusty, is delightful. The dirt road is improved rather than injured, as pneumatic tires pack the surface, and hence a common country road, well graded for highly efficient drainage, cheaply covered with two layers of coal tar, which, properly applied, soon hardens and forms a surface impervious to water or dust, is highly efficient and may be very economically constructed. Restricted to the use of pneumatic tires the roads should be much more durable and more economically maintained than macadam roads, for pneumatic tires will not suck the top layer off, and heavy steel-tired vehicles and iron horseshoes will not cut or chop the surface. It has been stated that the first layers of tar, properly applied, will last eighteen months; a second coat the next year will last two years; and a third coat practically indestructible on motor parkways.

What It Means to the Public.

"A motor parkway means that every acre of suburban property, made quickly accessible by connecting highways, will quickly quadruple, and in some cases multiply a hundredfold in value. It means transportation facilities may be acquired in available localities, merely for the construction of a cheap parkway without the

SOME NICE LOOKING TURKEYS FOR THANKSGIVING

enormous investment of capital now required in electric and steam railways.

"And hence because it is a business proposition, the problem of motor parkways will soon be solved. It is much more feasible and profitable than the old-time toll road. It unites the interests of farmers, business men, real estate and railway owners generally. No transportation subject is more important to the prosperity of the country or the happiness of the people, for, in its sphere, the motor parkway is equally as important as the steam or electric railway, and equally, if not more, practical and beneficial, and much more economical.

"And, hence, within a few years it seems reasonable to conclude that there will be motor parkways between New York and Philadelphia; Boston and New York; Buffalo, Niagara Falls, and Rochester; Chicago and Milwaukee, and other important centers, which will eventually lead to through trunk lines between all important cities, remembering that it is easier to consummate the enterprise through tracts not so well served with transportation facilities or good roads.

The Sporting Side of It.

"In addition, however, to the use of parkways by private owners, automobile racing, endurance, airship, and other contests will be so greatly encouraged, that circuits will be formed similar to horse racing. In the Vanderbilt Cup race the interest was intense, and the attendance, conservatively estimated at two hundred thousand people, was the largest that has ever attended any sporting event in the history of the world, notwithstanding the weather was inclement and most of the spectators not only rode a long distance during the night, but sat from dawn to noon without refreshments. Hence, it is reasonable to suppose that a large revenue from these sources will be certain, and, by comparison with horse racing, the estimate of receipts is truly conservative."

COMPETENT ROADMAKERS NEEDED.

SEATTLE, WASH., Nov. 24.—"If the government should make an appropriation, to be distributed among the various States at the present time for the purpose of road building, that money would be squandered because of the lack of competent men for correct road building." Thus declared Samuel C. Lancaster, consulting engineer of the office of good roads, United States Department of Agriculture, in an address before the Seattle Chamber of Commerce. Mr. Lancaster said it would take one hundred years to rectify the mistakes that would result from such a course before enough young men are properly trained in the work of road building, and further, that the requisites for road building were to secure men who know how to construct enduring roads, to have the right kind of material and all that.

In the Northwest, he said, he had found an abundance of excellent material. He spoke of the beauty of the mountains in this State, and suggested that if it had the drives of Europe, American tourists would be more satisfied with coming this way. In closing Mr. Lancaster said the universities should be turning out the kind of engineers needed as rapidly as possible.

MINNESOTA'S GOOD ROADS ACTIVITY.

MINNEAPOLIS, Nov. 26.—The good roads movement in Minnesota has assumed proportions during the year now closing which promise to place the State in the vanguard of Western States within a year or two. With a state highway commission in charge of the general road work in the State, the automobile clubs of Minneapolis, St. Paul and Duluth combining to engineer a "Tri-City Highway" of over 150 miles, and 1,500 rural carriers acting as original information sources for the State commission, the good roads crusade in Minnesota is expected to bear great fruit within a short time. To the activity of the automobilists is due much of the impetus given to the movement during the past two years. The route for the Tri-City highway, from Duluth, on Lake Superior, down to St. Paul and Minneapolis, is practically surveyed, and committees from the clubs of the three cities have spent weeks during the past summer in going over the roads, enlisting the aid of county officers and associations and preparing for the building of permanent automobile highway over the 180 miles. Secretary George W. Cooley has this week sent to each of the 1,500 rural carriers of the State requests for exact information as to the roads they cover.

MINNEAPOLIS Y. M. C. A. AUTO CLASS.

MINNEAPOLIS, MINN., Nov. 26.—Practical work in taking down and rebuilding cars is to be done during December by the automobile class of the Minneapolis Y. M. C. A. The local Y. M. C. A. furnishes practically the only instruction class for general attendance in the Northwest, and it is filled this year with drivers, owners and students. Walter Milner, a Minneapolis mechanical engineer, is in charge of the instruction. The local garage of Maxfield & Rice is to be the practical workroom for the class. The classrooms in the Y. M. C. A. building contain all apparatus for the demonstrating of theoretical shop work and for the preliminary instruction. Work in the garage will be a finishing course.

STUDEBAKER Y. M. C. A. CORNERSTONE LAID.

SOUTH BEND, IND., Nov. 26.—The cornerstone of the Young Men's Christian Association Building, presented to the Y. M. C. A. of South Bend by the Studebaker Brothers Manufacturing Company of this place, was laid last Tuesday afternoon with impressive ceremonies. On the stone is cut the words, "Erected A. D., 1906, and presented to the Young Men's Christian Association of South Bend by Studebaker Brothers Manufacturing Company in memory of five brothers." J. M. Studebaker, president of the company, and other prominent citizens, delivered addresses. Books, newspapers and other commemorative matter were inclosed in a copper box and sealed into the wall.

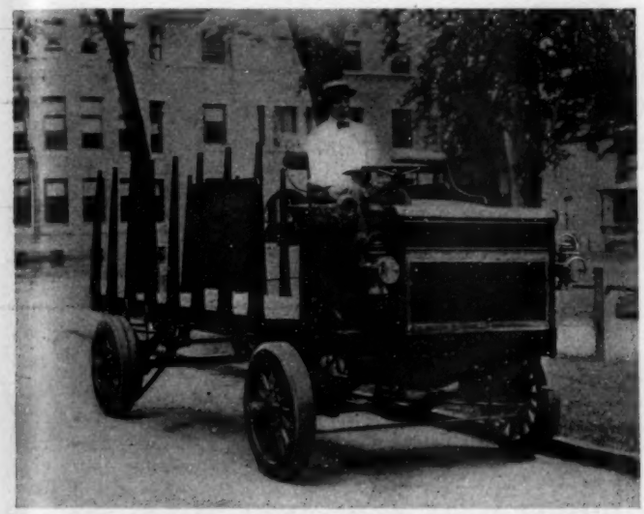
CHAS. J. GLIDDEN AND PARTY LEAVING CHICAGO.
The famous world-girdling tourist starting for Mexico on the railroad tracks at Lake street station, November 22, 1906.

AUTO CAR EQUIPMENT COMPANY'S LINE.

Confining itself to commercial automobiles, both for passenger and trucking business, the Auto Car Equipment Company, 77 and 79 Edward street, Buffalo, N. Y., fills these lines very completely either in its general lines or by construction to specifications. Of the first named three examples are illustrated in the ten-passenger electric brougham selling at $5,000, the twenty-passenger gasoline brake selling at $3,500, and the five-ton truck at $4,500.

The ten-passenger electric brougham is built with a body on luxuriant lines and furnishes an example of private theater or station conveyance thoroughly in keeping with modern ideas along these lines. The storage battery is carried under the body somewhat forward the center in the length of the vehicle. Double motor equipment is used, placed forward of the rear axle, each driving through a chain to the rear hub drums. The main frame is hung on four half-elliptical springs of good length. The vertical steering post is erected rather to the left and outside the driver's seat, to its left is the emergency brake lever acting on drums at the rear wheels.

The twenty-passenger gasoline brake has five cross seats. A four-cylinder water-cooled vertical motor is used, dividing the footboard of the front seat and extending back under this



SECRETARY E. B. OLMSTED TRIES THE NEW TRUCK.

same seat. Over the cylinder heads is placed a semicircular metal hood, closing in the motor for protection of the driver and passengers. The drive is through a double universal propeller shaft to a sliding gear transmission with a cross drive shaft and finally through two side chains. Jump-spark ignition is used, and a force-feed oiler with six sight feeds placed on the front panel board of the forward seat. Steering is through a vertical pillar with the control levers placed under the steering wheel. The cellular water cooler acts as the dash with everything kept well up from road dust.

The five-ton truck, shown with a stock platform, has its rear axle well forward to take the proper proportioning of the load on the platform. The vertical engine, four-cylinder and water cooled, is placed over the front axle and has placed above it the driver's seat and foot platform, the latter, unlike on the passenger brake, running in a straight line for the full width of the vehicle. The dash is open at the back above the footboard, being of the hooded design, and carries the cooler between this point and the main frame front cross member. The vertical steering column is at the right with the spark and throttle levers under the hand wheel. The change gear and emergency brake hand levers are just outside the right-hand end of the seat. The progressive type of change gear is used, operating the sliding gear for the forward speeds and the reverse. The flywheel clutch is connected to the transmission by a shaft having a universal at each end, although the line of drive is parallel to the road. Final drive is by cross-shaft and two chains to the rear wheel drums. The body is supported on four half elliptical springs hung at each end in brackets on the main frame sides. One of the brackets for each spring has a sliding block to compensate for the shifting distances between the mating bracket.

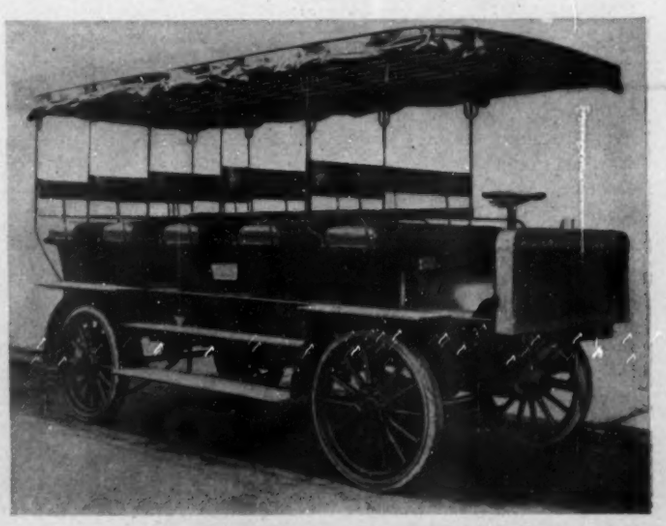
TEN-PASSENGER ELECTRIC BROUGHAM.

INDIANA GAINS TWO MORE AUTO MAKERS.

CONNERSVILLE, IND., Nov. 26.—With two large companies incorporated here within the last week, this city promises to become known as an automobile center within the near future. There are also several concerns here that manufacture accessories and parts.

The Connersville Motor Vehicle Company has a capital stock of $50,000, all subscribed by local capitalists. The company will manufacture automobiles, engines, street sweepers, and farming implements, and will have a large and modern factory. Those who are interested in it are J. B. McFarlan, Sr., J. B. McFarlan, Jr., C. E. McFarlan, J. H. Morrison, and Scott Michener.

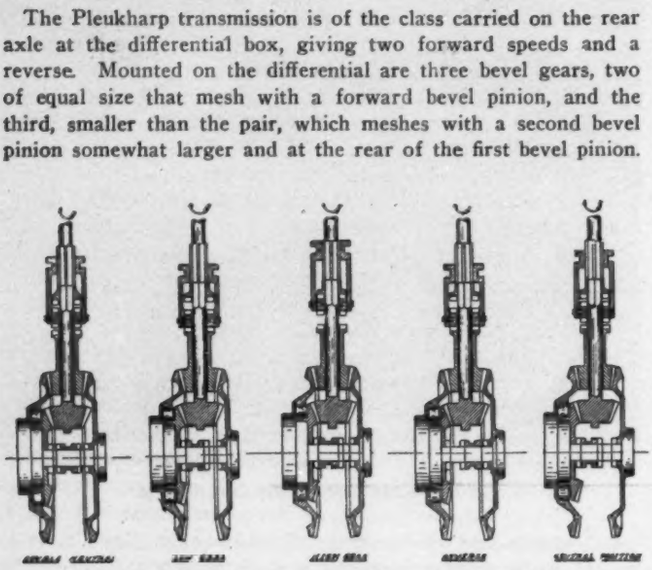
Another new concern is the Ray Motor Company, which has a capital stock of $100,000. The men behind the company are Rowan Ray, I. F. Geary, J. J. Maloney, L. D. McCall, and W. S. Calder. Both companies will be ready for operation early in the coming year.



TWENTY-PASSENGER GASOLINE BRAKE.

A NEW REAR AXLE TRANSMISSION.

The Pleukharp transmission is of the class carried on the rear axle at the differential box, giving two forward speeds and a reverse. Mounted on the differential are three bevel gears, two of equal size that mesh with a forward bevel pinion, and the third, smaller than the pair, which meshes with a second bevel pinion somewhat larger and at the rear of the first bevel pinion.



OPERATING POSITIONS OF THE PLEUKHARP TRANSMISSION.

The axes of these pinions are in line with the propeller shaft. This rear pinion has a forwardly extending stub shaft butting the propeller shaft. The forward pinion has a tubular shaft, surrounding the rear pinion stub shaft, with a forwardly facing jaw clutch at its front end. The stub shaft also has at its front end a jaw clutch, which faces to the rear. Surrounding this latter clutch as well as the butting ends of the pinion and propeller shaft is a sliding sleeve with an outer slot at its forward end for the operating fork and at its inner rear end a two-way jaw clutch. As this sleeve is moved to the rear the low gear is engaged. The extreme forward movement gives high and the intermediate position gives neutral. Reverse is had by means of a jaw clutch sliding in the main axle and engaging with the right-hand larger bevel gear. The drive is direct on all gears. All gears are in constant mesh, but on the high all other gears are idle.

PORT HURON GETS NORTHERN PLANT.

PORT HURON, MICH., Nov. 26.—Since word got out that the Northern Motor Car Company of Detroit was considering the enlargement of their plant they have received numerous propositions from cities all over the country.

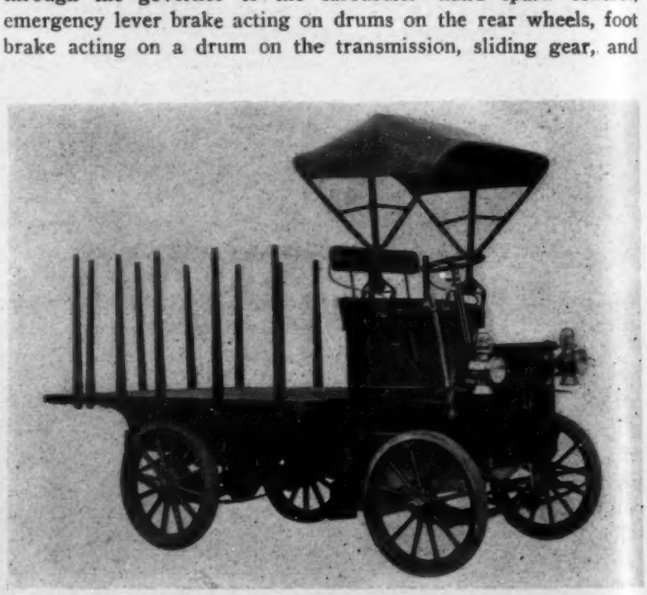
Port Huron, Mich., is the lucky city. The deal by which she secures a plant of the Northern Motor Car Company was practically consummated Friday afternoon at a meeting between the Port Huron Committee and W. T. Barbour and G. B. Gunderson, of Detroit, who represented the controlling interests in the company. The required $100,000 to be taken in Port Huron was oversubscribed, and any one of half a dozen sites can be obtained free, so that the only condition remaining yet to be met is the erection of a two-story building with 50,000 square feet of floor space. It is thought there will be no difficulty in having subscribers to the Chamber of Commerce fund agree to make sufficient advance payments on their subscriptions to raise the required amount without delay.

The Port Huron plant is to be devoted exclusively to making their two-cylinder models, while the Detroit plant, which is still to be continued, and from which the affairs of the company will be administered, will concentrate its energies on turning out their four-cylinder models. Purchases of machinery will be rushed at once, and it is expected to turn out between 250 and 300 two-cylinder models at the Port Huron plant during the season of 1907. From 300 to 400 hands will be employed when the factory is in working order.

1907 FRANKLIN ONE-TON TRUCK.

As a culmination of its experiments for the past three years the H. H. Franklin Manufacturing Company, of Syracuse, N. Y., is producing light trucks weighing 2,000 pounds with a carrying capacity of one ton. The driver's seat and footboard is placed directly over the motor and gearcase. The motor is, of course, air-cooled, of four cylinders, and rated at 12 horsepower. It carries all the well-known Franklin features, including the extra mechanical valve exhaust at the base of the stroke, and is placed longitudinally in the frame. The crankcase is of aluminum, with a removable base plate for interior inspection. The flywheel is of the fan type, assisting in engine cooling. A multiple disc clutch is used of alternating phosphor bronze and steel plates contained in an oil bath. The clutch driver, by means of a universal block, is connected directly with the transmission shaft. A flat spring holds the plates firmly against each other when the clutch is engaged. The drive is through sliding gears, with two forward and a reverse, with the hand lever forward on the quadrant for high. The final drive is through a worm gear, as experiments lead to the conclusion that through this there is less loss in gear reductions than with either chain or bevel gear final drive at the axle.

The oiler is carried directly at the side of the engine base, being driven through direct gear connection with the camshaft. The governor is of the centrifugal type, and is designed to give constant speed by eliminating all possiblity of engine racing. The carbureter is of float feed design, with the bypass operated mechanically by the throttle feed, with the gas feed through an aluminum manifold removable by the taking out of one screw. Ignition is by jump spark, with dry batteries arranged in two sets which may be used independently or together. The spark coil is placed under the seat, with a switch plug removable by the driver when the needs come for leaving the car at intervals of loading or unloading. The control is by hand throttle—acting through the governor to the carbureter—hand spark control, emergency lever brake acting on drums on the rear wheels, foot brake acting on a drum on the transmission, sliding gear, and

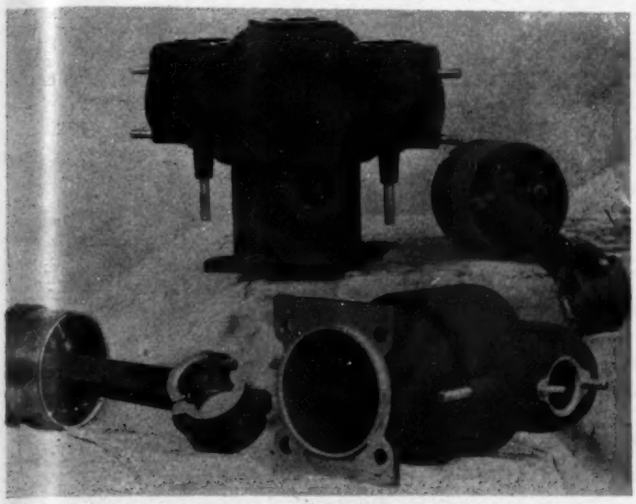


FRANKLIN 1907 ONE-TON COMMERCIAL CAR.

foot pedal for releasing clutch. Located on the front of the car are grill doors which open to expose the front of the motor. At the sides, and below the floor boards, are wide doors which allow full access to the side parts of the engine. In the platform is a small trap door which, when removed, uncovers the transmission case for inspection by the further removal of the case cover. By these various means a complete inspection can be readily made of any or all parts of the power plant without exposure of the working parts to all sorts of weather under continuous service and to their detriment.

SOME DETAILS OF MAXWELL MODEL M.

The details of modern practice in casting single cylinders, together with the essentials in finishing them, as well as the finishing and assembling of pistons and connecting rods, is shown in the illustrations of these parts of the Maxwell four-cylinder touring car, known as Model M. The cylinder illustrations show the general form taken in this type, where the valve housings are oppositely disposed. The assemblies of the piston and the connecting rod show a swinging, or hinged, take-up on the big end of the connecting rod, as well as the split and adjustable piston



MAXWELL CYLINDERS, PISTONS AND CONNECTING RODS.

end bearing of the same rod. The plan view of the chassis shows the hot water feed of the thermo-syphon, or gravity, system with the large pipe running over the cylinder heads to the Y connection leading into the cooler at the front. The straight through intake port feed pipe is also shown with its globular center directly over the carbureter to equalize the gas flow to the first and last cylinders. The base of the triangulated support of the combined crank, clutch and gear case is shown where the drive comes through to the forward universal on the propeller shaft. The relative position of the two hand levers and the steering wheel is given, as well as the length of the outside rear springs.

ANOTHER STORAGE BATTERY WONDER.

FOND DU LAC, WIS., Nov. 24, 1906.—According to local reports a company is to start here, within a few days, in the manufacture of a battery for which large claims are made.

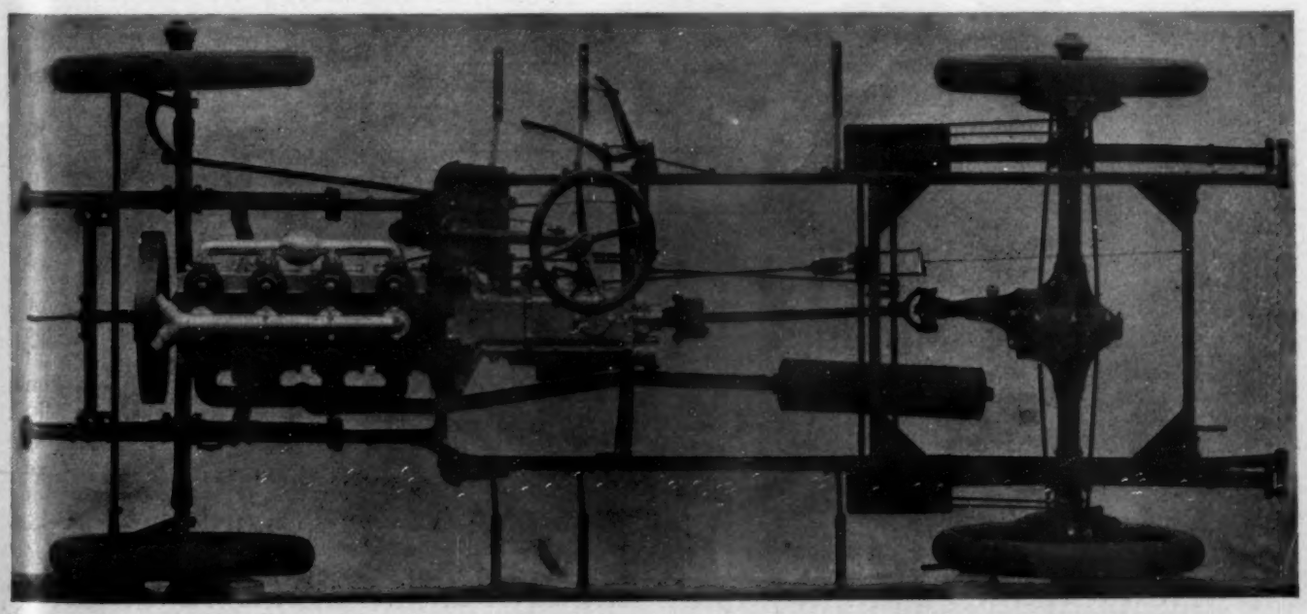
According to the descriptions of the battery furnished, a standard cell, weighing eighteen pounds, has a capacity of 1,000 ampere hours without recharging. The cell is six inches square and ten inches deep. The new battery can be recharged in a few minutes. All that is necessary is to add 90 per cent. of water to the chemicals, which are manufactured in the form of crystals or a thick syrup. Enough to charge forty cells weighs about thirty pounds, and, it is claimed, will carry a touring car from four hundred to five hundred miles. The cost of current is said to be less than two cents a kilowatt.

There is considerable mystery shrouding the name of the inventor and the proposed company. The information so far given out is that the inventor hails from Milwaukee, is a Yale graduate and a former lecturer on electro-chemistry. In this latter work the discovery came somewhat by accident and three years have been spent in perfecting the invention.

It is claimed that the inventor made a recent test in a runabout traveling 260 miles between Milwaukee and Chicago.

AN OCEAN RACE FOR MOTOR BOATS NEXT JUNE.

Long ocean races in the past have always been associated with big, expensive craft manned by numerous sailors and costing nobody knows how much to keep in commission. Now, however, the man who owns a little 35-foot trunk cabin power boat heads for the open sea in the most unconcerned way in the world, thanks to the recent development of that type of craft, and comes safely through weather that would mean certain destruction to the old street-car cabin type of boat. A remarkable test is to be made of boats of this type next summer when, on June 8, a race will be started from New York for Bermuda—a distance of 670 nautical miles—for cruisers not more than sixty feet or not less than forty feet over all, propelled by internal combustion engines, the prize being a trophy valued at $1,000 and donated by a member of the New York Yacht Club. The race will be held under the auspices of the Motor Boat Club of America, and details will be announced shortly. Three entries have already been made, one being the cruiser *Sis*, which was second in the 280-mile race from Marblehead to New York held last summer. The Royal Bermuda Yacht Club will cooperate with the New York club in the management of the event.



CHASSIS OF MODEL M MAXWELL, SHOWING GENERAL VIEW OF ASSEMBLED DETAILS FROM ABOVE.

AN EFFECTIVE ANTI-FREEZING SOLUTION.

There are a number of substances from which may readily be made so-called anti-freezing solutions for winter use in the motor-cooling water circulation systems of automobiles. All of them may have the virtue of remaining liquid at the coldest temperatures experienced in ordinary climates, but some of them have injurious effects upon the car. Thus, for instance, a tendency to corrode metal parts is noticeable in the use of solutions containing salts, while glycerine solutions have a slight tendency to injure rubber.

Here is a solution recommended by the Packard Motor Car Company, of Detroit, after having been used by the company at its factory during two winters: Wood alcohol, 15 per cent.; glycerine, 15 per cent.; water, 70 per cent. This solution will withstand freezing at five degrees below Fahrenheit, and for colder weather add 2 per cent. each of alcohol and glycerine, down to 15 degrees below zero, Fahrenheit.

An alcohol solution has no injurious effect, but has a tendency to evaporate in usage and thereby is expensive. However, alcohol will not separate from water and waste independently. Its boiling point is very low and it reduces the boiling point of a mixture of water and alcohol, so that on warm days, when the motor is running with the car standing still, the alcohol and water mixture will boil easily and both alcohol and water will pass off together as steam. This action, while wasteful of alcohol, does not greatly change the proportion of alcohol and water. It has been found, by actual experiment, that in a closed circulation system a 30 per cent. solution of wood alcohol had, after thirty days, been reduced only to a 20 per cent. solution.

Glycerine costs nearly three times as much as alcohol, and in making a solution to resist freezing a much higher percentage is required than of alcohol. Hence, it is originally the more expensive solution. It has also the disadvantage of being slightly injurious to rubber.

Experiments have shown that a piece of rubber water hose left sufficiently long in a bottle of glycerine will be reduced entirely to the canvas fabric. On the other hand, glycerine has a high boiling point and is the better solution for both warm and cold days.

It has been found, by experiment, that a solution of glycerine —regardless of the percentage of glycerine, within ordinary limits—raises the boiling point of water to about 213.5 degrees Fahrenheit. Thus, a glycerine solution is practically proof against loss by boiling. A 30 per cent. solution of alcohol boils at 168 degrees Fahrenheit and a 40 per cent. solution boils at 150 degrees.

Taking these things into consideration, a combination mixture of one-half wood alcohol and one-half glycerine was suggested, and, by trial, found to possess more nearly than anything else the cold-resisting quality of the pure alcohol in combination with the safe boiling limit of glycerine and other desirable properties of each. The following tables show, from actual tests made, the freezing points of solutions, respectively, of glycerine, of wood alcohol and of a mixture of one-half wood alcohol and one-half glycerine:

PURE GLYCERINE.		WOOD ALCOHOL.		HALF WOOD ALCOHOL AND HALF GLYCERINE.	
Percentage in Water	Freezing Point Fahrenheit	Percentage in Water	Freezing Point Fahrenheit	Percentage in Water	Freezing Point Fahrenheit
5	30	5	25	5	28
10	28	10	18	10	25
15	25	15	11	15	20
20	23	20	5	20	15
25	19	25	2	25	8
30	15	30	9	30	5
35	12	35	15	33	15
40	5	40	23		
50	2				
55	10				

A solution to use in ordinary climates that will probably give the most generally satisfactory results is one of 15 per cent. wood alcohol, 15 per cent. glycerine and 70 per cent. water, to which alcohol should be added in small quantities from time to time. The glycerine will not waste, and the addition of alcohol, as the winter proceeds, will not only repair waste, but increase the efficiency of the solution. In extreme cold weather this solution may be used with as high as 50 per cent. of the alcohol-glycerine mixture.

Among solutions of salts the most common one is made by simply dissolving calcium chloride in water. It has a decided corrosive effect. The accompanying table shows its efficiency in different proportions:

CALCIUM CHLORIDE.

Commercial Calcium Chloride to Each Gallon of Water	Freezing Point Fahrenheit
1 pound	27
2 pounds	18
3 pounds	1.5
3½ pounds	8
4 pounds	17
5 pounds	39

Still another solution which may be used is: Glycerine, 49 per cent.; sodium carbonate, 2 per cent.; water, 49 per cent. It is also possible to use common salt by dissolving one and one-half pounds of rock salt in each gallon of water and adding two ounces of sodium carbonate. This will not have great injurious influence, but is not highly efficient. Its chief virtue is cheapness.

OLDSMOBILE RACERS FOR 1907.

There will be two Oldsmobiles in every important contest held in this country next season. Recognizing that the successes achieved in racing by the foreigners is largely due to their building the cars months before the season for racing and other contests open and have ample time to thoroughly try out the cars and to train their drivers, the Olds Motor Works, of Lansing, Mich., started to build two cars immediately after the recent Vanderbilt Cup race. The cars will soon be ready for road tests. One will be a stripped stock car of 40 horsepower and the other a six-cylinder car designed for over 100 horsepower. The former will compete in several events at the Florida tournament this winter and will participate in hill climbing, track and beach events throughout the year. The six-cylinder will be entered in all road races, or the like, held in America.

F. L. Smith, vice-president and general manager of the Olds Motor Works, in announcing the building of the two racing cars, said: "We thoroughly believe in racing. Benefits are derived from racing which tend to develop and perfect a manufacturer's regular product. The public are very much interested in automobile racing, and for this reason it should be encouraged. One of the things necessary for success in racing is getting the cars ready in time, and this is why we are now building the Oldsmobile which will carry our colors in next season's races."

RAINIER CARS IN NEW ENGLAND.

BOSTON, MASS., Nov. 27.—John R. Buck, who for years has been chief auditor for the White Company, has resigned his position with that house and organized a corporation to locate in this city to handle Rainier automobiles exclusively. The concern will be capitalized at $200,000 and will erect a large building to be used as a show and salesroom and a garage.

A petition in bankruptcy has been filed against the Central Park Automobile Storage Company, of New York City. It is alleged that the company had admitted its insolvency. The company was incorporated a year ago with $40,000 capital stock and erected a one-story garage on the circle at One Hundred and Tenth street and Central Park West.

A COMBINATION GOGGLE FOR WOMEN.

American women every day are becoming more and more interested in what they shall wear automobiling. New fashions are constantly arising and new ideas for the comfort of the enthusiast being developed. Very often it is the smallest detail of correct dress for the machine that renders the greatest comfort; and surely this is true of the means employed for the protection of the eyes. Wind is just as painful to these delicate organs as is dust, and proper protection should be secured even if one does not apparently suffer from the results of a brisk drive in the open air.

There is on the market a pair of goggles made expressly for women autoists which seems to meet all the requirements. Besides being complete in construction these goggles are not unbecoming as is the general rule with automobile glasses. Another advantage that this particular style holds over others is the separate face shield that can be removed or adjusted in an instant. The shield is made of suède or leather and lined with white

HOW THE COMBINATION GOGGLES ARE MANIPULATED.

coney. The lenses which are of the finest glass are framed with a perfect ventilating device and finished with a chenille binding. The windows are also removable so that smoked glass may be inserted when desired. The accompanying illustration will give the reader an idea of how the combination goggles are manipulated. In inclement weather they serve as a partial face-mask, adding materially to the wearer's comfort.

A CARBURETER FROM TENNESSEE.

NASHVILLE, TENN., Nov. 26.—The Hagar Carbureter Company, with headquarters in this city, has just obtained a charter under the laws of Tennessee with a capitalization of $15,000. Its first models will be on exhibition at the Madison Square Garden Show. The carbureter is said to be something entirely new and has been pronounced by experts as second to none thus far manufactured. The company has only put out one or two for trial tests, from which it has been receiving encouraging reports. They will soon be in a position to make large contracts for 1907 delivery. The officers of the new company are: D. F. Kenner, president; C. S. Brown, vice-president and general manager; C. Coddington, treasurer; and Charles C. Gilbert, secretary.

HENRY J. CASEY AND HIS SISTER IN "SHAMROCK, JR."

A PACIFIC COAST BOY'S AUTO.

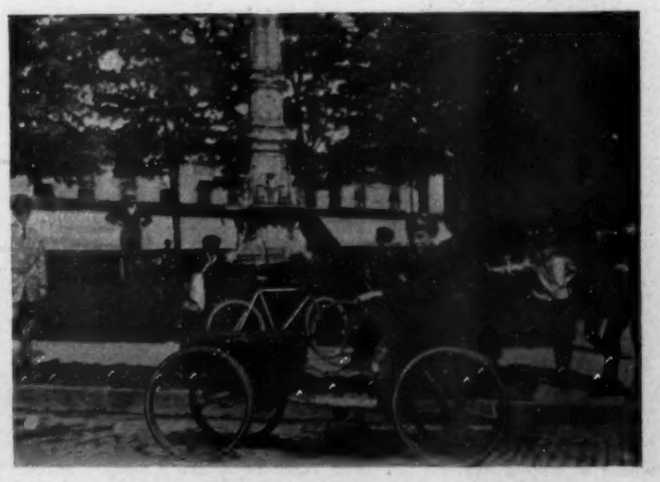
SEATTLE, WASH., Nov. 15.—*Shamrock Junior* is the name that Henry J. Casey, "copy kid" of the Seattle *Times*, and living at 1417 Twenty-third avenue, has given the car he has just completed the construction of. The photograph shows Master Casey about to leave the shed he uses as garage, for a spin.

For the past five months young Casey has been putting in all his spare time constructing the car, and all except the turning work and the motor was done by him. A Holley motorcycle engine of 2 1-4-horsepower is used. There is a gasoline tank holding three gallons, with an auxiliary under the dashboard. The car has a speed of six and a half miles on the low gear, and between twelve and thirteen miles on the high, and is controlled by two throttles under the steering wheel and a clutch.

The wheel base is 52 inches, the entire length is 6 feet, and the width is 25 inches. There are 20-inch wheels, and the seat is neatly upholstered. The car, fully equipped, weighs 225 pounds, and represents an outlay of $200. It will run between twenty-five and thirty miles on one gallon of gasoline.

FRED PICKLE AND HIS HOME-MADE AUTO.

GREENVILLE, MICH., Nov. 24.—What a young man can do if he wishes is tersely told in picture here published. Fred Pickle, of this city, who is shown in the peculiar automobile, is the constructor of the entire machine and spent months in his task. The auto is operated by a two-cylinder engine which develops 3 1-2 horsepower. The wheels are ordinary bicycle wheels. Young Pickle has traveled all over western Michigan in his unique machine. The photo was taken in Grand Rapids, Mich.



FRED PICKLE IN HIS HOME-MADE AUTOMOBILE.

HOW THE GARAGES ARE MULTIPLYING

A New Reinforced Concrete Garage for Tarrytown, N. Y.

In celebration of the opening of their new garage, now in course of erection at Tarrytown, N. Y., on New Year's Eve, Koenig Brothers intend giving prizes to the first five automobilists to arrive in their cars from New York City, in a run which is being organized for the occasion. A garage has been conducted for several years by Koenig Brothers in connection with their machine shop, which for the past fifteen years has been on Main street, near the ferry. To accommodate the constantly increasing business, the new garage is being built on the main traveled highway, the Old Post Road. The garage will be fireproof, being built of reinforced concrete. The building is 50x85, with two stories and a basement. The ground floor will be exclusively devoted to storage, sales and locker rooms. The second floor will be arranged for a ladies' parlor and chauffeurs' quarters, with baths, reading-rooms, lockers, etc. The repair shop will be in the basement, equipped with new machinery, the present plant being equipped with electric power. When a car is driven into the garage, either for storage or repairs, all articles left in the cars will be removed and placed in the lockers on the same floor, a memorandum being made at the time, which will be signed by the owner, to whom will be given a duplicate key of the locker.

The equipment beyond the repair shop outfit will include two Cooper-Hewitt mercury converters, one for ignition and one for electric vehicle batteries. There will also be a complete tire-repairing outfit, consisting of a tube vulcanizer, a sectional vulcanizer, and a recovering plant. There will also be a lecture room, in which will be conducted an automobile school, with models showing the different types, and in conjunction with outdoor demonstrations.

Government Will Institute Special Garage for Imports.

Due to the rapidly increasing automobile imports at the Port of New York, the United States customs authorities, for the second time, find it necessary to look for a larger garage in which to examine and appraise the machines. Up to a few months ago all automobiles entered from abroad were appraised at the public stores. Last summer the extraordinary increase in importations made necessary quarters outside the federal building owing to the extensive floor space required for proper handling. As a result space was rented in a bonded warehouse on West Twelfth street. Now these are inadequate, besides being too dark for the proper examination of the cars. This brought about a conference, last Saturday, between Assistant Secretary of the Treasury John H. Edwards, Deputy Collector Henry L. Swords and Appraiser of the Port Edward S. Fowler, with the result arrangements are now in progress for a large customs garage, with the possibility that the location may be well up-town, near the automobile-selling center.

Garage in Old Mission Architecture at Stockton, Cal.

Plans for a modern garage at Stockton, Cal., have been completed, to be built on the southeast corner of San Joaquin and Lafayette streets, for the California Automobile Company. The building will be built of brick and patterned after the old Mission style of architecture. There will be an entrance from each street with an electric turntable for the dual exits.

Asbury Park, N. J., to Have Mammoth Garage.

BALTIMORE, MD., Nov. 26.—George B. Baker has purchased the Y. M. C. A. athletic grounds at Asbury Park, N. J., with the intention of erecting a large garage on the property, work on which will soon begin. The tract consists of about twenty acres, and the consideration was about $21,000.

Six-Story Garage to be Built at Seattle, Wash.

SEATTLE, WASH., Nov. 22.—The Pacific Coast Automobile Company has broken ground for a garage at 1414 Broadway. The foundation is to be for a six-story building, the first two stories and basement of which will be completed this year. The first floor is to be reinforced concrete, making it absolutely fireproof. A two-ton hydraulic elevator will be installed to facilitate the handling of cars. On the first floor will be located the offices and a retiring room for ladies. There will also be a room for men, with lockers. The repair shop will be on the second floor and will be equipped with a full complement of machine tools. The company is capitalized at $25,000, with the following officers: President, E. C. Guffray; vice-president, W. C. Bigelow; secretary and treasurer, George B. Lamping. Associated with the company as salesman is Chester Coulter, formerly with the Northwest Motor Company. The company has the agency for the Pope-Toledo, Thomas Flyer, Detroit Thomas, Oldsmobile, Buick Pope-Waverly Electric and a commercial line.

Allentown's Fireproof Garage Is Nearly Completed.

The new four-story garage of the Berwin Auto Company, at 128-132 North Eighth street, Allentown, Pa., is nearly completed. The building is 50 x 110 feet and of fireproof construction. The entrance and exit is at the center with a showroom on one side and the waiting and dressing rooms on the other. In conjunction with a turntable and other modern conveniences, a four-ton elevator in the rear of the building runs to the machine shop on the top floor. At the front of the building is a passenger elevator. The oil and gasoline storage is in an underground outside house, with pumps for delivery.

Wichita, Kan., Has Just Opened Its Fourth Garage.

Under the name of the Wilson Automobile Company a new garage has been opened at 118 South Lawrence avenue, Wichita, Kan. This garage will be fully equipped with machinery and is the fourth to open in that city. H. A. Wilson, for several years of Miller V. Scott, of Colorado Springs, Colo., and Scott E. Winne are the proprietors.

NOTES OF THE GARAGES.

A garage is to be opened at East Wayne street, Ft. Wayne, Ind., by Charles Hanna and George Aldrich.

Plans have been filed for a one-story garage on Riverside Drive, New York City, just north of One Hundred and Sixty-first street. The building is to be 62 x 123 feet and will be occupied by the Heights Garage and Storage Company. The cost is given at $35,000.

At the annual meeting of the Albany Garage Company, of Albany, N. Y., Edward W. Leahy, who has been with the company from its inception, was elected superintendent. Mr. Leahy was the third automobile owner in Albany, having purchased his first car, a Locomobile, in 1899, and is the youngest charter member of the Albany Automobile Club.

The Seaton Automobile Company, of Utica, N. Y., has been organized and has purchased the plant of the Black Diamond Automobile Company on Sunset avenue. A modern garage and repair shop will be established with a capacity for storing 100 cars. A. J. Seaton, former president of the Buckmobile Company, is the manager of the new concern.

THINGS TO REMEMBER ABOUT TIRES.

FROM PNEUS MICHELIN.

Always keep your tires well inflated, as a tire run partly deflated will become weak on the sides near the tread and blow-outs are liable to occur at the part so affected.

When applying new shoes it is best to ascertain if any sharp places are on the flange of the rim, as rim cuts often occur by the rim not being perfectly smooth.

Insist on your extra shoes being removed from the car when having same washed, as water inside of a shoe will have a tendency to weaken the fabric.

Remember your tires require attention the same as any other part of your car; they are the weakest part of an automobile, get the roughest usage, and least attention. Do not back up or go forward against curbstones, as this is a good way to ruin a tire. Your contention will be that the tire is defective, you fail to recall having wedged it between several thousand pounds and an unmovable sidewalk.

Rim-cut tires are often caused by taking corners at too high a speed; remember that only a little fabric and rubber are holding up your heavy car.

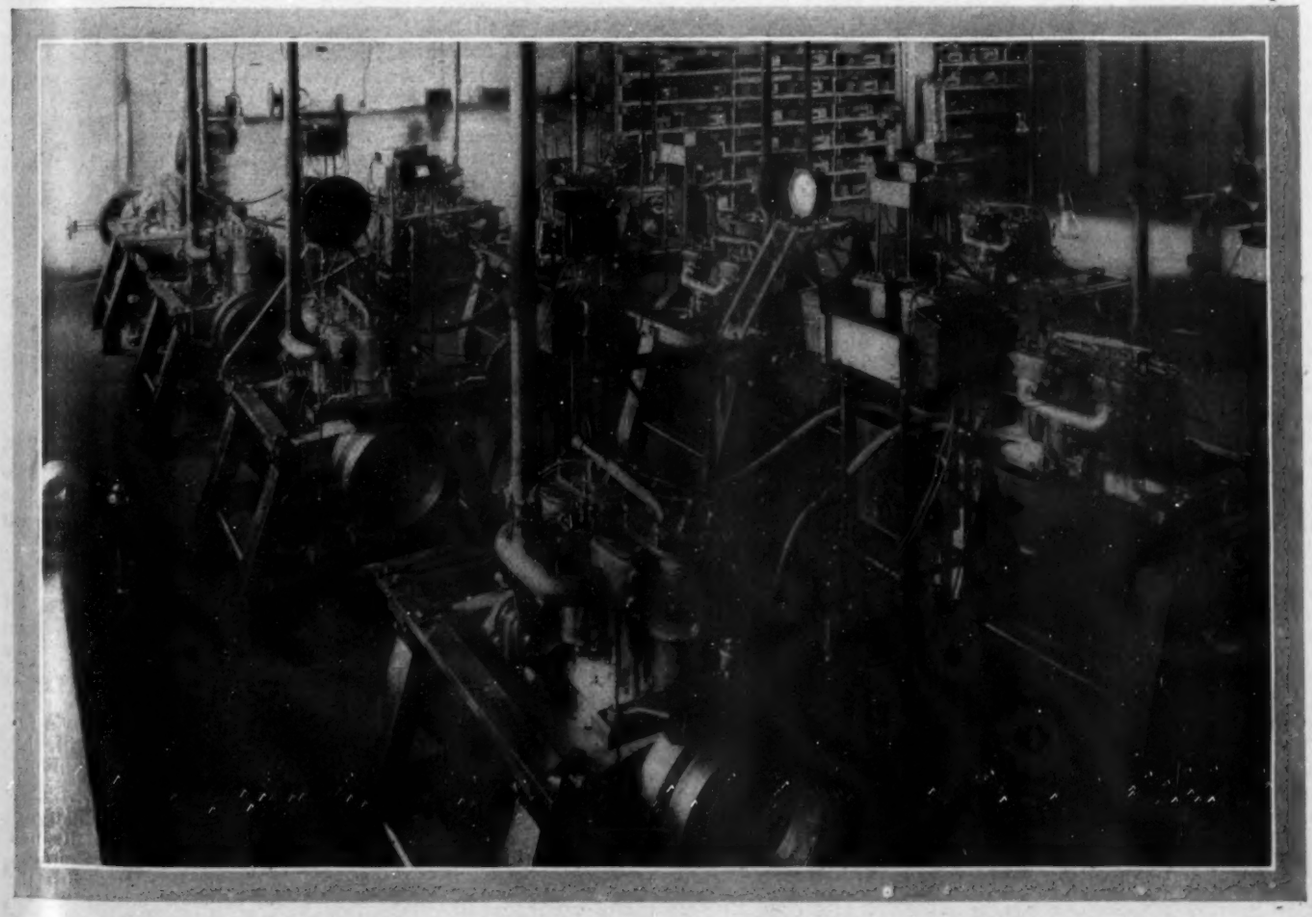
How Spare Tires are Ruined.

Spare tires require almost as much attention as do tires in use. Many drivers, especially inexperienced drivers, do not give much thought to the extra tires carried, until they are wanted to replace one in use—this is a mistake. Extra tires strapped to the side of a car without a cover are exposed to every condition of weather—the sun, rain, and cold make great inroads on the life of the materials and the part that rests on the hangers and running-board will become worn and defective, no matter how perfect the tire was when purchased. Don't neglect your spare tires—keep them covered at all times and once every day turn them around a foot. If this advice is followed conscientiously your extra tires will be as perfect when you want them as they were when you strapped them to the hangers.

ENGINE TESTING BY MANUFACTURERS.

Few mechanisms receive the thoroughness of final testing given automobile engines, which largely accounts for the now generally understood fact that the automobile as a whole, and its engine in particular, can and does stand more abuse, and receives less running attention than is accorded to any power plant in common use. As an example of departmental work in the first test given, a view is shown on this paper of a corner in the Packard testing room. The methods of testing vary in different factories as to details, but the general layout can be understood from the illustration. The motors are mounted on standards that represent the engine frame in the chassis. All connections, spark, carbureter, water and exhaust, are then made simulating road running conditions. Next come the specific connections for power tests. In the Packard plant the brake beam, known as the prony, test is used. The upper beam has a long projecting arm, the outer end of which is connected to the floor by a spring scale. The additional device needed is a speed register. With this outfit the brake horsepower is arrived at by use of a formula that takes in the speed of the engine, the distance from the flywheel center to the beam connection with the scale and the pounds pull on the scale. This is only the beginning, for, after the engine has been brought to the standard set for the prony test, it is given its road test. This is followed in many factories by a tearing down, inspection, reassembling and block and road tests again.

George W. Perkins, of New York, will build a one-story garage on his Riverdale estate to cost $11,000. The building will be of brick, one story high and cover a ground space of 49 by 76 feet.



ONE CORNER OF THE ENGINE TESTING DEPARTMENT OF THE PACKARD FACTORY AT DETROIT, MICH.

NEWS AND TRADE MISCELLANY.

The Arbogast Motor Company, of Chicago, has filed a voluntary petition in bankruptcy with liabilities totaling $57,519.45 and assets of $118.50.

The Fairmount Engineering Works, of Philadelphia, where the Chadwick cars are built, will be enlarged in order to make a larger output possible.

Koenig Bros., of Tarrytown, N. Y., are looking for an automobile agency in connection with the opening of their new garage on the Albany Post Road.

A company is being organized at Mooreland, Ind., by James Stanley, the inventor of an automobile which he states can be sold at a good profit for $375.

Work has been commenced on a large addition to the plant of the Welch Motor Car Company, of Pontiac, Mich., to increase the productive capacity of the factory. The addition will be nearly as large as the original factory.

The automobile agency and repair business heretofore conducted by M. C. Henley & Son, of Richmond, Ind., has been purchased by Draper & Whitsell, who will carry on the business in the Auto Inn, leased from M. C. Henley.

An usually fine salesroom, devoted exclusively to the handling of Baker electric vehicles, has been opened by C. B. Rice at 1790 Broadway, New York. The old quarters were found to be entirely inadequate to handle increasing business.

The American Motor Company is preparing to recommence its work of manufacturing gasoline motors in the Clarke building, Eau Claire, Wis., having moved from St. Paul. Gasoline motors ranging from 1 1-2 to 100 horsepower will be built.

Leather chain guards, completely enclosing the side chains, are features of the 1907 Stearns cars. These guards are packed half full of grease, so that the chains are not only thoroughly protected from dirt, but are always properly lubricated.

The Henshaw Motor Car Company, of Boston, has been incorporated by C. S. Henshaw, the Haynes New England representative, to take care of the rapidly-growing business and to facilitate the handling of a larger trade during the coming season.

The Colburn Automobile Company, of Denver, Col., is building a car whose engine is specially adapted for work in high altitudes, where the rarity of the atmosphere often unfavorably affects the running of ordinary motors. Popular touring car lines are followed.

A company has been formed by E. J. Gulick, for four years superintendent of the Packard factory in Detroit, for the manufacture of a two-cylinder car of his own design, to be known as the American Simplex. The car will, it is said, embody a number of novel features.

The Jackson-Church-Wilcox Company of Saginaw, Mich., a concern recently organized to manufacture automobile parts, is preparing to put on the market a delivery truck of new design, to carry three tons. The first car is practically finished and will be used for demonstrating.

The Rambler Company, of Chicago, is negotiating for new and more roomy quarters on Michigan avenue, being about to desert the old automobile row. The plans made contemplate the purchase of a site near Fourteenth street and the erection of a fine modern garage.

In the Winton Model M three methods of disengaging the power are provided. The gears may be placed in neutral position, the clutch may be disengaged in the usual way by pedal, and the clutch may be thrown out and the brake applied simultaneously by a single lever connected with both.

The new factory building of the Buick Company, at Flint, Mich., is practically ready for occupancy, and the work of transferring the machinery from the Jackson plant is in progress. Flint will be the company's headquarters after December 1. The engine works are now running at full capacity.

Tire bursts and blowouts due to excessive air-pressure caused by over-inflation, expansion from heating and compression from sudden violent shocks are guarded against by the Arnold Tire Safety Valve, a little valve 1 1-2 inches long that screws on the inflating valve of the tire in place of the ordinary cap. Each valve is adjusted to the tire it is used on.

The Brooklyn Motor Supply Company, 1175 Bedford avenue, Brooklyn, N. Y., is placing on the market a preparation under the trade name of Nonfreeze for use in coolers through the winter. It is claimed that it prevents the water freezing at 30 degrees below zero. Although it contains calcium chloride, the preparation has been highly refined to overcome the troubles incidental to the use of the commercial product.

The Cadillac Company, of Chicago, Ill., the local Cadillac agency, has offered a 1907 Cadillac Model M, fully equipped, as a prize to the Cadillac user who will write the best story of the record of his car. Mileage, length of service, fuel economy, cost of maintenance, and other points will be taken into consideration in making the award, which will be entirely free and unconditional. Sidney S. Gorham, secretary of the A. A. A., is chairman of a committee for making the award.

The Pittsburg Automatic Vise and Tool Company, Pittsburg, Pa., has issued an extremely neat catalog describing its automatic vises, which are designated as a radical departure in construction, being designed to meet the requirements of the worker, including a most effective grip, great range of movement, phenomenal strength, and automatic simplicity. The Pittsburg vise is designated by its makers as "the modern gun of the world's workshop."

All of the notable steep hills in the vicinity of New York City were recently negotiated on high speed by one of the new model Oldsmobile four-cylinder touring car, carrying five passengers. Fort Lee, Riverdale, Cobblestone, and Abbey hills were the worst of the collection, these grades being usually avoided by automobilists. A considerable proportion of the output of 1907 Oldsmobile cars of this type have already been sold and delivered.

The New Process Metal Company, of Columbus, O., a recently incorporated concern manufacturing babbitt metal for automobile work, is endeavoring to secure a site for a factory adequate to its needs, meantime carrying on business in the old plant at 546 Park street, where the work has been going on under a partnership for the past six months. The incorporators were Harry K. Ridgeway, Walter N. Floyd, Fred U. Diehl, R. M. Erwin, and C. W. Drake.

The word "Mark," as used by the manufacturers of the Columbia as other makers use "Model" or "Type," and followed by a Roman numeral, is considered such a valuable feature from a publicity point of view that a proposition to use Arabic instead of Roman numerals was strongly opposed by agents and others, and the style of designation will remain unchanged. A number of European makers use synonymous designations, but the Columbia is the only American car to make use of the work "Mark."

An automobile bus line, operated between Daytona, Seabreeze, and Daytona Beach, Florida, by the Daytona Auto Transit Company, will commence running on regular schedule on December 1 with one bus, and a second will be added as soon as the traffic demands it. A special bus will also be put on to do street car service through the streets of Daytona. The company has a very large garage, where touring cars may be chartered and supplies obtained. Special arrangements are being made for storage during the races, and orders will be booked up to January 1.

According to the compilation of the Association of Licensed Automobile Manufacturers, 1,204 automobiles with a total value of $4,400,000, were imported in the first ten calendar months of this year. This is an increase of 292 automobiles, valued at $1,250,000, for the corresponding period of last year. Of this year's importation there were 496 automobiles imported by eight licensees and 400 by thirty-six non-licensees. Direct importation by owners foot up 245 machines with 60 per cent under the Selden license. The balance of the total is made up of sixteen electric and forty-seven trucks and cabs.

The Board of Extension Teaching of Columbia University, New York, announces a series of nine evening technical courses to be given at the university, beginning December 3 and lasting for twenty weeks. Lectures will be given by professors and instructors of the university, and will cover engineering physics, elementary mathematics, drafting, strength of materials, machine design, structural design, electrical engineering, steam engineering, and special engineering problems. Fees from $7.50 to $15. Full information may be obtained by addressing Evening Technical Courses, Extension Teaching, Columbia University.

RECENT TRADE REMOVALS.

The Thomas B. Jeffery Company's Los Angeles, Cal., agent, L. H. Hill, has moved into new quarters on Valencia street, near Fourteenth, that city.

The Prentiss Motor Car Company, of Boston, has taken possession of its new quarters at 15 Berkeley street and is already giving demonstrations with the 1907 Studebaker cars.

Howard M. Covey, of Portland, Ore., has sold his interest in the Covey &

Cook Motor Car Company and has engaged in business for himself, handling the Pierce, Locomobile, Knox and Cadillac cars.

R. Bertelli & Co., of New York, sole American agents for the Zust Italian automobiles, have moved from their old quarters on East Nineteenth street to 144 West Thirty-ninth street, where they occupy the entire building. The former place was entirely outgrown.

NEW AGENCIES ESTABLISHED.

The agency for the Rainier Car for Mexico has been placed with Mr. H. T. Braschi, of Mexico City, Mexico.

The Holsman automobile interests in the State of New Jersey will be looked after by Sheldon W. Case, of Montclair, N. J., who has secured the agency.

The Royal Auto Company, of Boston, has secured the agency for the St. Louis Motor Car Company, of Peoria, Ill., and will locate at 741 Boylston street, Boston. F. J. Farr and F. E. Wodell will be the salesmen.

Announcement has been made by George W. John, sales manager for the St. Louis Car Company, that the old Winton salesroom and garage at Broadway and Fifty-fourth street will be the new home of the American Mors car.

The Boston agency for the Mora cars is in the hands of H. E. Whiting, manager of the Boston Mechanical Company, and since the arrival of a demonstrating car Mr. Whiting has had his hands full attending to prospective purchasers.

The Matheson car will be handled in the counties of Albany, Rensselaer, Montgomery, and other counties as far as Newburg by the Albany Garage Company, of Albany. The Matheson car will be represented at Ormond by a 60-horsepower touring car.

W. F. Hays has recently become the sole manager for the Apperson product in New York. The new salesrooms at 1665 Broadway, corner Fifty-second street, are being redecorated and fitted for the reception of the new Apperson cars. The new headquarters will be ready for occupancy Dec. 1.

Maitland H. G. Davies has been appointed sole distributing agent for the W. E. B. spark plug for Northern New Jersey, New York State and the Metropolitan district. Mr. Davies has opened headquarters at 1686 Broadway, and will have a fine exhibit of the plugs at the A. C. A. show.

The Cornish-Friedberg Company, of Chicago, has secured the agency for the Gale cars, manufactured by the Western Tool Works, of Galesburg, Ill. In addition, the Cornish-Friedberg is having a special car built to order—a big four-cylinder 30-horsepower touring car—to sell for $2,000.

New agencies established by the Wayne Automobile Company, Detroit, Mich., are as follows: Walden W. Shaw, Chicago, Ill.; West Side Motor Company, Inc., Hamilton, Ohio; Bonney Motor Car Company, Kansas City, Mo.; Freed & Bransford, Salt Lake City, Utah; Soules-Welch Motor Car Company, Detroit, Mich.

A new agency, handling the Cartercar, will shortly be opened in Cleveland in Euclid avenue, near Seventeenth street, by A. W. and V. R. Hall, under the firm name of Hall Brothers. In addition to the downtown salesroom there will be two garages, one at East Sixty-sixth street, and the other on Wade Park avenue.

Agency connections for the sale of automobile tires and other accessories have been made by Morgan & Wright, of Chicago, with the Pittsburg Rubber Company, of 528 Park Building, Pittsburg, Pa.; Rochester Rubber Company, 55 Main street east, Rochester, N. Y.; and the Iroquois Rubber Company, of 45 Pearl street, Buffalo.

The entire State of Indiana has been allotted to S. J. Summer as territory for the sale of the Holsman runabouts. Mr. Summer formerly covered only the northern part of the State. Headquarters will now be at 118 East Ohio street, Indianapolis. Special efforts will be made to interest physicians and rural carriers in the machine.

The Ajax-Grieb Rubber Company announces that a branch will be established at 1461 Michigan avenue, Chicago, in charge of H. W. Terroere. Another branch will be established in Boston within a few weeks, while the main office and salesroom will be moved to the automobile section of Broadway, New York, where A. S. LeVine of the sales department will have his headquarters. The Los Angeles branch is now open at 1046 South Main street, in charge of C. F. Startsman.

A long lease of the premises at Broadway and Eightieth street, New York, has been secured by the Autocar Company, of Ardmore, Pa. Arrangements have been made with Furman & Furman to manage the place. G. M. Furman, one of the members of the firm, has traveled extensively, familiarizing himself with the requirements of the work, and will be thoroughly conversant with the most modern methods, and Edwin H. Furman, who is to have the active management, will have the benefit of his knowledge and experience.

Agencies for the Stearns cars for 1907, as far as announced, are as follows: Wyckoff, Church & Partridge, New York City; A. E. Morrison Company, Boston; The Motor Shop, Philadelphia; Fort Pitt Automobile Company, Pittsburg, Pa.; Scottsdale Automobile Company, Scottsdale, Pa.; United States Automobile Company, Rochester, N. Y.; Hughes Automobile Company, Cincinnati, O.; Reyburn Motor Car Company, St. Louis; Capital City Automobile Company, Atlanta, Ga.; Githens Brothers Company, Chicago; The Automobile Company, San Francisco; R. H. Mahlke, Wheeling, W. Va.

PERSONAL TRADE MENTION.

A. H. Dorsey, late of the sales department of the Harry Fosdick Company, of Boston, is to be sales manager for Titman, Leeds & Co., of Philadelphia, agents for the Studebaker cars.

A. E. Schwartz, formerly of the Wayne Company, of New York, will sail for Europe November 29 to represent the American Motor Car Manufacturing Association at the Paris and other foreign shows.

C. H. Rockwell, formerly with the Haynes Automobile Company, is to direct the work of the publicity department which has been added to the organization of the Autocar Company, of Ardmore, Pa.

Samuel E. Bailey, president of the York Motor Car Company, of York, Pa., visited New York last week and inspected the new showrooms of the Bouton Motor Company, at 1675 Broadway, where the York Pullman will be sold.

C. A. Hawkins has been appointed Western representative of the White Company, with headquarters in Chicago, and William Gardner, formerly assistant manager in San Francisco, will be manager of the San Francisco branch. Mr. Hawkins was for years the Pacific Coast representative of the White Company.

F. S. Corlew, vice-president and sales manager of the Dragon Automobile Company, of Philadelphia, will have his headquarters at the Boston branch, which has been established at 117 Massachusetts avenue, that city. U. S. Daniels, formerly of Grand Rapids, Mich., will be his assistant.

Ralph Mongini, the well-known driver who handled the Matheson car in the elimination trials for the Vanderbilt Cup race, is to be head demonstrator and salesman for the Matheson in New York, the change being consequent upon the death of Tom Cooper. Harold E. Callison, stepson of President Singer of the Matheson Company, has been made assistant secretary of the New York company, and Frank Lescauld has been retained as mechanical expert.

TIRES FOR LIGHT CARS.

The Independent Tire and Rubber Company, Akron, Ohio, announces that it is manufacturing tires especially suitable for light touring cars and runabouts. It is stated by the company that these tires are sold at reasonable prices with a view to meeting the requirements of those wanting reliable goods for use under moderate weight and speed conditions.

RECENT INCORPORATIONS.

The Craig-Toledo Motor Company of Toledo; capital, $100,000.

Pardee & Canary Company, Chicago, Ill.; capital, $50,000. Principals, Fred J. Pardee and Dan J. Canary.

The American Motor Company, Eau Claire; capital, $15,000. Incorporators, Roy P. Wilcox, C. T. Rundy, and Hannah F. Johnson.

The Racine Gas Engine Company, Racine; capital, $25,000. Incorporators, Edward Hoernel, Andrew Rasmussen, and Charles Rasmussen.

Mercedes Repair Company, Albany, N. Y.; capital, $30,000. Directors, Henry Hitchenbach, A. C. Beckert, and W. C. Suttgen, New York.

Henshaw Motor Car Company, of Boston, Mass.; capital, $10,000. To deal in automobiles. Incorporators, C. M. Henshaw and W. T. McQuillan.

Gillingham Auto and Supply Company, Newark, N. J.; capital, $100,000. Incorporators, Geore O. Gillingham, Frederick W. Sanford, and George W. W. Porter.

The Hills Motor Car Company, Philadelphia, Pa. To manufacture, buy, sell, lease, store, and repair automobiles and motor vehicles. D. Wendell Hulburn, solicitor.

The Dauer Automobile Company, Providence, R. I. To deal in automobiles; capital stock, $5,000. Incorporators, Edward Dauer, William Fletcher, and Roland M. Ballou.

INFORMATION FOR AUTO USERS.

FOSTER SHOCK BRAKE.—The Foster Shock Brake, illustrated herewith, is the invention of C. H. Foster, of the Gabriel Horn Manufacturing Company, of Cleveland, O., and is manufactured by that concern. It is of the piston and cylinder type, the piston

DESCRIPTIVE CUT OF FOSTER SHOCK BRAKE.

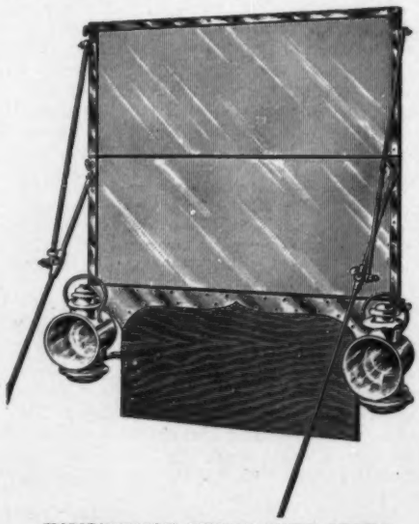
working in a light but strong cylinder of cold drawn steel filled with oil. Eight small holes in the piston head permit the oil to flow through slowly, and the piston cannot move faster than it can displace the oil. The end of the piston rod is attached to the frame of the car, just above the axle, and the cylinder is attached to the axle by means of a clip which permits the requisite oscillation of the cylinder as the car body rises and falls on the road. When the machine is at rest the oil is normally in the bottom of the cylinder; under the influence of a sudden shock, tending to compress the springs, the piston is forced towards the bottom of the cylinder, displacing some of the oil as it does so and allowing the springs to be compressed and extended only fast enough to absorb road shocks without causing violent jouncing and unpleasant and sudden contacts between the passengers and the seats of the car. The Foster Shock Brake is light in weight and compact; it is adjustable in every direction, and can be applied to any machine.

NATIONAL SPARKER.—The National Battery Company, of Buffalo, N. Y., has brought out the 1907 model of the National Sparker—a storage battery made expressly

NATIONAL SPARKER STORAGE BATTERY.

for supplying ignition current for internal combustion motors. A number of improvements have been made over the 1906 battery. The battery is put up in an oak case stained with a celluloid filler and attractively finished. The whole will stand rough handling, as it is substantially made. The battery jars are of a special hard rubber, and are of such dimensions that there is a small space between the jar and the wood case. Into this space is poured a molten composition which, when it has set, has much of the appearance of hard rubber and cements the jars and case into a solid block, at the same time affording protection to the jars and avoiding any chance of leakage. The plates are of the National staggered construction, and are of materials that have been adopted as the best after a long series of practical tests. The plates are welded to the place straps and are well reinforced. The groups of plates are kept apart by ribbed separators of hard rubber, which effectually guard against short-circuits in this direction and are not affected by the acid. Connections between the cells are made with lead links carefully burned to the posts, there being at these points no copper or bronze connections to corrode or sulphate. The outside terminals are of heavy continuous lead posts, through which extend brass studs heavily lead coated. The nuts used are heavily coated with lead, so that the chances of corrosion are reduced very greatly. The cells are filled through hard rubber tubes which are closed, when not in use, by stoppers fitted with hard rubber vents, which permit the escape of gases but prevent slopping of the acid. The battery is fitted with a convenient handle of heavy acid-proof leather.

DIVIDED GLASS FRONT.—The accompanying illustration shows a glass wind-shield for automobiles made by the Limousine-Carriage Manufacturing Company, of Mich-



HORIZONTALLY DIVIDED WIND SHIELD.

igan avenue and Thirty-fifth street, Chicago, Ill. This device has the advantage of being divided horizontally, but has no hinge and when the upper half is lowered the neat appearance is retained. The arrangement is simple and effective. The rods supporting the upper half terminate at their lower ends in sleeves which slide on the rods supporting the lower half, and are fitted with set-screws for holding them in position. In the frame of the upper half are two tapered pins, one on each side, which engage in correspondingly tapered holes in the frame of the lower half. These, with the rods, hold the whole shield rigidly erect. When it is desired to lower the top part the set-screws on the sleeves are loosened and the top lifted until the taper pins are disengaged. Then the top is lowered parallel to the lower part until its upper edge is level with the upper edge of the lower part. Hooks and pins engage as this position is reached, holding the shield securely. The frames are made of wood with heavy brass sheathing or of polished mahogany with brass corner pieces.

NEW SPEED INDICATOR.—Under the name of the Index speed indicator the Oliver Instrument Company, of Minneapolis, Minn.,

THE NEW INDEX SPEED INDICATOR.

has brought out a very neat instrument for showing the rate at which the vehicle to which it is attached is traveling; the illustration gives a good idea of the exterior appearance of the Index. It has the usual bracket for attachment to the dashboard of the car. The dial is 2 3-4 inches in diameter and the figures are bold and plain. An advantage is that the graduations on the dial are all equally spaced; the manufacturers state that when the instrument is in use the hand is perfectly steady, so that readings can be taken as easily as from a clock. In the mechanism of the Index centrifugal force is employed to actuate the indicating needle. A heavy brass ring hangs on two trunnions placed at diametrically opposite points in its circumference, and the pivots are attached to a vertical shaft rotated by the usual flexible shaft and gear arrangement. A spring tends to keep the ring tilted, but centrifugal force, when the shaft and ring are rotated, tends to counteract this and to bring the ring to a horizontal position. Thus the higher the speed the more nearly horizontal will the ring be, and its movements between full tilt and horizontal are transmitted through an ingenious linkage system to the needle. In the lower part of the dial are the faces of a trip odometer and a total odometer, thus making the instrument complete and self-contained. Ball bearings are used for the main spindle and for the ring pivots, reducing friction to a minimum. Drive is by a steel universal link shaft, and the odometer is driven by a ratchet mechanism, so that the drive may be from either wheel without special arrangements, and the instrument will record all movements of the car, forward or backward.

SOOT-PROOF SPARK PLUG.—The manufacturers of the spark plug, illustrated herewith, C. A. Mezger, Inc., 40 West Sixtieth street, New York, claim that the plug is actually soot-proof, and that it may be deliberately smoked up, placed in a cylinder, and will then spark and ignite the charges as readily as a clean plug, and, moreover, that after running for a short time the carbon deposit will be burned off, leaving the plug clean. The insulation is of hand-turned porcelain, and, as the illustration

MEZGER SOOT-PROOF SPARK PLUG.

shows, there is a chamber in the insulation immediately surrounding the central electrode and another in the shell of the plug surrounding the insulation. In order to short-circuit the current must travel over a long distance—two inches—on the surface of the porcelain, and it is easier to jump the small space of a thirty-second of an inch between the sparking points than to take the roundabout way. The insulation is in a single piece and is large and strong.

KITSEE SPARKING BATTERY.—A new ignition storage battery for which a remarkable output is claimed is the Kitsee, manufactured by the Kitsee Storage Battery Company, of 628 Connell Building, Scranton, Pa. It is stated that the output is approximately double that of any other storage battery, weight for weight. For instance, the 60-ampere hour, 6-volt battery weighs complete 19 1-2 pounds; the 120-ampere hour battery, 6 volts, weighs 30 1-2 pounds; and the 180-ampere hour, 6-volt battery weighs 41 1-2 pounds. These weights include case. The plates are constructed on a new plan, the active material being held between long continuous strips of lead, so arranged that the plates cannot expand in service or, as battery men say, "grow." The makers state that long and hard tests have proved the battery to be equal to the most exacting service, and able to withstand usage.

FABRIC SUPPLIES.—The many important uses to which leather, artificial leather, enameled duck and other fabrics can be put in connection with the automobile have resulted in a number of manufacturers devoting their attention to this one branch of the supply business. Among these is the firm of Hopewell Brothers, of 42 Osborn street, Cambridge, A., Mass. A small but business-like catalogue gives a good idea of the products of this concern. The Hopewell tire case, for the protection of the spare tire, is made of either enameled duck or artificial leather. A cord at one end and a metallic cable at the other serve to close up the case and it fits the tire perfectly, without wrinkling. The case is made of black enameled duck and in artificial leather which may be had in a variety of colors. In addition to the tire case there are listed tool rolls of leather in all colors, which are said to be waterproof, stainproof, greaseproof and very durable; sleeve protectors of a special rubber cloth; artificial leather inner tube cases, made in four sizes; automobile robes of thin rubber-coated fabric for summer use; of heavy plush, double, for cold weather; and of heavy plush with fabric lining and rubber interlining, the latter making an exceedingly warm robe, wind and water proof. An interesting specialty is a series of vests of paper and fabric paper, light in weight, very warm, windproof and low in price.

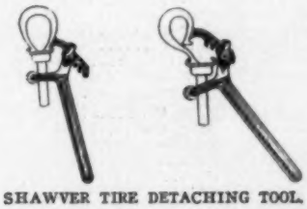
SAGER SPRING SPECIALTIES.—The J. H. Sager Company, of Rochester, N. Y., is continuing the manufacture of its equalizing springs in exactly the same form as they were first made two years ago, it having been found unnecessary to make any changes. This device prevents the unpleasant tossing about that the body of a car without any device of this nature receives on a rough road. A new device has been brought out, however, called the Sager Flexible, designed to remedy the painfully apparent defects of short, stiff springs on automobiles. The coils of the device, which is illustrated herewith, are designed to provide the flexibility which is lacking in a stiff flat spring. The Sager Flexible is not intended to be used in place of the Sager equalizing springs, but can be used in conjunction with them, or with any other

SAGER SPRING SHOCK ABSORBER.

shock absorber. The Flexible can be applied to a car in fifteen minutes. The Sager company is also manufacturing a new type of non-skidding device which, together with the spring devices mentioned, will be exhibited at the coming automobile show.

SPRAGUE BOW SOCKETS.—It is well known that a weak point in the bows used to support an automobile top is just where the socket is bent to permit the top to fold back. An ordinary carriage socket of the tubular type is not considered sufficiently substantial for automobile work by the Sprague Umbrella Company, of Norwalk, O., and a special socket has been designed. This consists of a laminated steel tube into which the foot of the ash bow fits, electrically welded to a solid steel forging in which the necessary bend is made. The steel forging is of enormous strength in comparison to the work it is called upon to perform, and the curve is obtained without weakening the steel. The wood part is supported and braced by the steel tube, making a structure that, the manufacturers state, is absolutely unbreakable under any condition of service.

TIRE DETACHING TOOL.—Tires that have been on their rims for some time are almost invariably found to be stuck when it becomes necessary to remove them. Prying with more or less sharp tools and pounding on the tire are commonly resorted to in order to free the shoe—practices which, needless to say, are apt to have an injurious



SHAWVER TIRE DETACHING TOOL.

effect on the tire. To provide an easy way of removing tires, and one that will not in any way be injurious to the shoe, a tool known as the Springfield tire tool has been brought out by the Shawver Company, of Springfield, O. The accompanying illustrations show the form of the tool and the manner of using it. The part of the tool that comes against the shoe is broad and curved to conform to the shape of the shoe, while the part that rests against the spoke is a wood roll, which automatically takes the correct position for loosening the tire. The tool is made in one size only, suitable for handling tires having diameters of from 3 to 5 inches. The weight of the tool is 1 1-4 pounds and the price $1.25.

KEEPING CARS CLEAN.—The Royal Polish Company, of 301 West Sixty-third street, New York, has brought out a polish called Autoshine for cleaning, polishing and preserving the finish of automobiles or other varnished surfaces. In the words of the manufacturers, Autoshine is for automobiles and anything that autoshine. It is said to be entirely free from gumming and from anything that will injure the finish.

CATALOGUES RECEIVED.

C. T. HAM MANUFACTURING COMPANY, Rochester, N. Y.—Catalogue of the Ham Cold Blast automobile lamps burning oil.

RUSHMORE DYNAMO WORKS, Plainfield, N. J.—Illustrated booklet describing the Rushmore electric headlight for locomotives.

LANE MOTOR VEHICLE COMPANY, Poughkeepsie, N. Y.—Catalogue of Lane steam touring cars with 15-horsepower compound condensing engines.

JANNEY, STEINMETZ & CO., Philadelphia.—Catalogue of pressed and seamless drawn steel specialties—tanks, cylinders, boiler shells, reservoirs, and the like.

CINCINNATI MILLING MACHINE COMPANY, Cincinnati, O.—Large illustrated catalogue of milling machines, plain and with special features and attachments. Extremely interesting to a shop man.

THE JOSEPH DIXON CRUCIBLE COMPANY, Jersey City, N. J.—"Graphite as a Lubricant," a booklet explaining the various uses to which flake graphite may be put and the best methods of using it.

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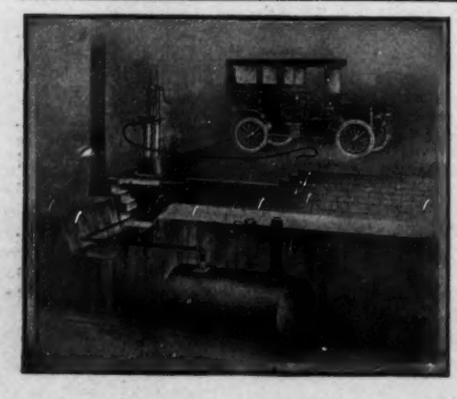

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